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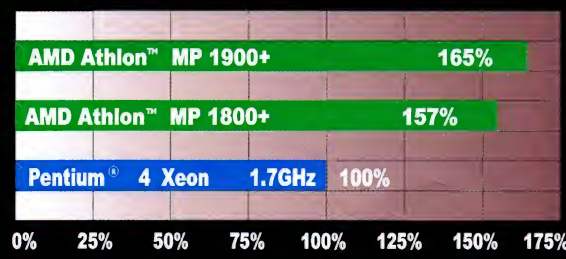

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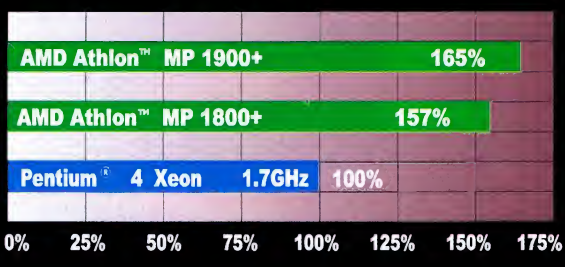

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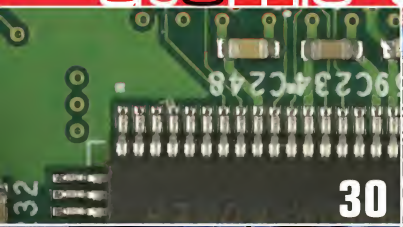

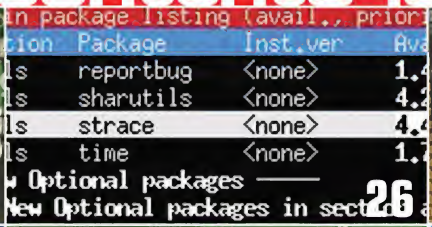

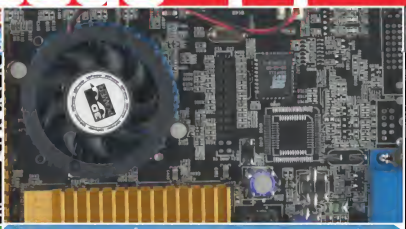

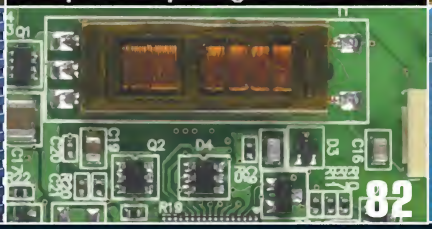

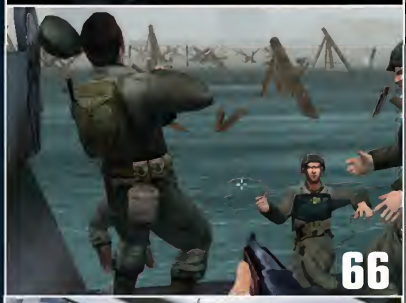

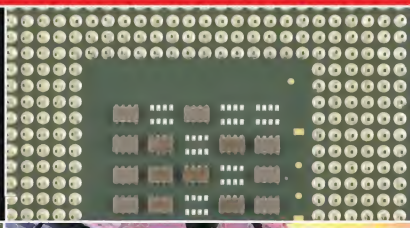

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Cutting Sick

If one was to ask, and one shall: what makes an Atomican? Surely the possession of a hot box would rate as a starting point. Case modding is the most gloriously overt expression of PC love we know. It's exactly the same for lovers of relatively cheap but extremely powerful cars. We demand nothing less than a full body kit, maaate.

You may not yet be sporting a full modded beastie, but you're thinking about it, aren't you? Maybe you'll start with a little extra cooling, perhaps add a fanbus after that – mainly because it adds a few more switches to the front. Extra buttonry does look tasty, eh? How about a DigiDoc, then? Nice and easy to install off the shelf lights and buttonage. Lovely.

Then it kinda spirals into the hardcore. You'll put handles on it, even if it never leaves the house. A few Atomic stickers, then you'll be looking at the next logical progression – neon, paint and Perspex.

There's little point in installing a neon or two unless there's a gaping porthole in the side for that beautiful light to flood forth from. But, cutting holes and painting are serious craftwork. Tools and time and blood are involved, as is a full breakdown of your lovingly assembled hardware. Hasslesville, man.

The spirit of free enterprise to the rescue! We're seeing more and more 'pre-fab' hot boxes come onto the market. Pre-cut with Perspex installed, painted any colour or scheme you desire. Too easy. Yes, too easy. The mainstream has caught up with us, Atomicans. Neon and Perspex are no longer 1337.

The case modding movement has accomplished its goal. It has awakened PC enthusiasts from their beige slumber. This community has always led, has always seen the creative possibilities, and has always shamelessly loved the machine.

It's time to take it to the next level. We've seen the possibilities. In Atomic we've seen the Turbine PC, Heph, Panties' . . . thing and even Phluffy. People still speak in awe about these mods. I know the guys that did these mods are still glowing from the praise. How good do they feel? As good as you ever can, if you get all juicy with your immense creativity.

Do whatever it takes to enter full-sick creative inspiration-mode, lock yourself in the garage with the most dangerous power tools in your collection. Scavenge hard. If you find something that clearly shouldn't be a PC - then you've got a starting point. And don't forget to send us some photos.

Ben Mansill

atomic
MAXIMUM POWER COMPUTING

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Short Circuits

Watches are ubiquitous in today's society. Not since quartz crystal technology has the watch undergone any major upgrade in basic functionality. However, a recent innovation by researchers working for Bristol University will change forever the way we see and use the humble watch.

The product of much time and effort on the part of BU researchers is a GPS enabled watch capable of telling you the location of the four pubs closest to you, as well as your distance from each.

This is the pinnacle of IT R&D. Years of research and billions of dollars have lead to this one single overarching achievement. Now that we have it, there's no real point in further IT research. After all, if you know the location of the nearest pub, what more could you want?

Sony has announced May this year as the release date for its 'Linux (for PlayStation 2)' kit. The kit will initially retail for US$199 and will be solely available over the Net from here: www.us.playstation.com. It will include a 40GB internal HDD for PlayStation 2, an Ethernet 100BaseT network adaptor, Linux Kernel 2.2.1 (with USB support), 'Linux (for PlayStation 2)' version 1.0 software on two DVDs, gcc 2.95.2, glibc 2.2.2 with VU assemblers, Xfree86 3.3.6 with PlayStation 2 GS support, computer monitor adaptor and USB keyboard and mouse.

Users must have a standard North American PlayStation 2 (SCPH 30001, SCPH 30001R, SCPH 35001GT). You will also need a standard VESA monitor.

For more information on the PS2 Linux scene see www.playstation2-linux.com

Broadband in an imperfect world

Telstra's been at it again. Not content with the opinions of bandwidth starved Aussies using the company's substandard 'broadband' products, our country's largest Telco has resorted to rigging public opinion polls. When ZDNet Australia asked its readers 'Does Telstra's BigPond Internet service provide value for money?', the initial response was 28 no votes and 1 yes vote. One half-hour later, those results had swung wildly to a 'yes' vote of 287. Further investigation revealed that 286 of these 'yes' votes had originated from an IP belonging to Telstra Internet Managed Services. Someone at IMS knew what true public opinion would be (obviously, as they're the ones providing a bad service) and didn't care to have prospective customers put off by the truth. Rather than let its real customers voice their opinions, Telstra used an automated voting script to repeatedly vote 'yes' to the ZDNet poll.

After realising what had happened, ZDNet replaced its poll with a new one – 'Should Telstra compensate its customers for regular service interruptions'. Again, the Telstra script swung into action to influence the results.

One can only wonder at the sheer ignorance of the person or persons at Telstra who thought up this little scheme. Not only was it obvious that something was wrong with the results of both polls – the swing generated the fastest response rate to a ZDNet poll the company has ever seen – but the person responsible did not possess even the minuscule amount of foresight needed to run their script from a non-Telstra owned IP.

Telstra's initial response to accusations of poll rigging was guarded. A spokesperson for the company stated the practice '[is] not a Telstra endorsed initiative'. However, once management and Telstra PR conferred, the company laid blame squarely at ZDNet's feet with the following gem; 'It served to highlight your polls are not that robust'.

Regardless of who initiated Telstra poll rigging, this incident is the latest in a long line of controversies surrounding the company's dismal broadband service and policies. Despite constant barrages of criticism from the Australian Internet community, Telstra continues to further degrade the services it provides while constantly modifying its Terms of Service and jacking up prices. Far from listening to its customers and taking steps to correct faults it seems the only voice Telstra hears is the bottom line.

You have the right to do as we say say

Having spyware programs surreptitiously installed with your favourite Peer-2-Peer file sharing application is almost a given these days. In fact, you would be hard pressed to find a P2P program that hasn't included spyware as part of its distribution at one time or another – after all, it's provides a major source of income. Most P2P application companies will take spyware out of their programs (or at least give us an opt-out option) once exposed by users. It's also standard practice for the P2P company in question to issue an apology of sorts. Popular P2P app Audio Galaxy had, until recently, been bundled with a somewhat innocuous file called VX2.cc. This file is a mandatory part of the Audio Galaxy install routine, but the only hint Audio Galaxy gives you about the existence of VX2 is hidden at the end of its Terms of Agreement. 'Onflow along with VX2 has created this statement in order to demonstrate our firm commitment to Internet privacy.'

According to VX2's privacy policy – which is amazingly hard to find – 'VX2's software also collects some information from online forms that you fill out. This information is automatically sent to VX2 in order to save you the time and trouble of submitting such information to us yourself.' Perhaps it never occurred to VX2 that we don't send them information simply because we refuse to.

The important part of the above quote is 'collects some information from online forms'. Basically, VX2 collects information you type into HTML forms and sends it off to VX2 servers. No one knows what VX2 wants with this information, nor what it does once it's in its possession.

As we went to print, Audio Galaxy is yet to furnish a comment regarding the inclusion of VX2 spyware in previous iterations of its controversial software.

However, Onflow has issued a statement that can be viewed at www.poenews.com/inhouse/onflow.htm.

For those of you wanting to continue using Audio Galaxy – but may not be liking the idea of having your emails read by VX2, the current Audio Galaxy installer is clean. Uninstall Audio Galaxy and use Lavasoft's Ad-aware (www.lsfileserv.com/index.html) to clean VX2 from your system before re-installing Audio Galaxy, using the newest installer.

Atomic WorldLAN GibFragCON '97 XP

On February 17 and 18, a LAN the likes of which the world has never been seen before shook the La Trobe University campus in Melbourne. The first ever Atomic WorldLAN GibFragCON '97 XP aimed to raise a healthy amount of cash for the Multiple Sclerosis Society, as well as give the Atomic community a place to finally meet and greet those they had come to know so well via the Atomic forums and IRC channel. Approximately 200 attendees partook in the 48 hours of fraggin' fun, and the end result was a donation of $1,771 to the MS Society, along with countless hours of entertainment.

Unlike most LANs, the focus wasn't on annihilating your opponents; fun was the key word at this event. So as well as the traditional CounterStrike and Unreal Tournament tournaments, some slightly more Atomic events were held as well. Who could forget the revolutionary FrisbeeMark competition, where the aim was to lob old pieces of hardware over large distances into a small target zone (also known as a cardboard box)? A selection of skits performed by the attendees left the audience speechless, while the VIA Need for Speed challenge raised the high speed stakes. We couldn't have an Atomic event without a Hot Box competition, and the trivia questions separated the n00b135 from the h4xOr5.

The ratio of prizes to attendees was simply amazing thanks to the generosity of the sponsors. At over $10,000 worth in total, the player to prize ratio was an amazing $50 per player.

Mad props go out to the Atomic readers who did the majority of the organising and running of GibFragCON '97 XP: Mad Man Modz, Mael, Gramyre, Chaos Lady and a whole bunch more. Without their tireless efforts this event could never have happened. And finally a huge thanks to the Shafted crew, whose l337 networking skills kept the LAN up and running without a single hitch for the entire two days. It was a fine 48 hours that won't soon be forgotten by any of us.

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Short Circuits

Geoff Crammond's Grand Prix 4 is coming to an Xbox near you. Perhaps the most popular racing series in PC gaming history, the latest iteration of Grand Prix is being released on console for the first time in June this year. The game will have the official FIA 2001 World Championship licence, so you can expect to see all the cars, all the drivers, all the tracks and all the action from the real F1 2001 championship season.

Before all you PC zealots out there write in about the death of PC gaming, you're not being left out in the cold. Infogrames plans to release Grand Prix 4 for PC at the same time as the Xbox version. wOOt!

LindowsOS, the Linux based operating system supposedly capable of running both Linux and Windows programs natively, has attracted much publicity and hype since it was first announced by Lindows.com. Many wondered how a Linux based operating system could run Windows binaries without using some form of emulation or 'Windows compatibility layer', a la` WINE. The first reviews of LindowsOS are starting to appear and we can now tell you that LindowsOS uses WINE itself to run Windows binaries. Whether the version of WINE used by LindowsOS is customised or not is unclear. However, the most likely scenario is WINE with proprietary extensions.

Atomic is currently in contact with Lindows.com and will print an in-depth review of LindowsOS v1.0 code as soon as humanly possible. Until then, you can read a review of the Sneak Preview code at www.newsforge.com/article.pl?sid=02/01/25/1811226&mode=thread

Short Circuits

Grand Theft Auto 3 is back baby! Take 2 Interactive has tweaked its code and the new version has passed unscathed through the OFLC's medieval censorship process to hit the shelves of a games shop near you. Thanks to the lack of an 'R' rating for games – despite one being available for movies and video since the 1970s – Take2 was forced to make some minor changes, including removal of the ability to pick up prostitutes, and making pedestrians much harder to hit.

Still, we should be thankful Take2 took the time to tweak its game for our market. It would have been much easier for the company to simply remove its game from Australia and sell it to the rest of the civilized world instead.

Loki Entertainment Software, famous for bringing such classic games as Quake 3: Arena, Tribes 2 and Alpha Centauri to Linux, has closed its doors. Loki filed for Chapter 11 during August last year in an attempt to protect itself from creditors as it re-organised its operations. However, Loki's desperate action failed to save it and the company will now go into liquidation.

Despite this sad loss to the Linux community, the news isn't all bad. The contents of Loki's public CVS, its FAQs, mailing list, archives and demos will be available to the public after Loki has closed. Also to be added are projects Loki was working on at the time of closure. Hopefully, the Linux community will rise to this challenge and attempt to finish Loki's uncompleted games for the enjoyment of all. By the time you read this, mirrors of Loki code should be available from www.lokigames.com

Raven Mad

ⓘ What ever happened to the good old Six Gun?

Atomic recently had the chance to preview betas of two of Raven's latest babies: Jedi Knight 2: Jedi Outcast and Soldier of Fortune 2: Double Helix.

Jedi Knight 2 is shaping up well, despite evidence of much work to be done on certain aspects of the game such as character models and animations. Battle is frantic and at times extremely frustrating as enemies fire on you from 15 different directions with blaster rifles. The net affect is to leave you sprawled on the floor in a pool of blood, fifteen seconds after entering the room.

Light Sabre combat is hard. Extremely hard. Playing on normal difficulty, our poor Kyle was cut down time after time as he attempted to deflect a myriad of blaster bolts. However, after setting the experience level to maximum from the console, Kyle returned blaster bolts back to their points of origin with ease. By the time you read this we will have final code, so expect a review in the next issue.

Soldier of Fortune II looks as sweet as its screenshots suggest. Unfortunately, the build we were shown was a month or two out of date and it showed in certain aspects of the game. It was possible to shoot enemy soldiers and have the rest of the group – who stood facing you from a distance of two meters – continue to smoke cigarettes without a care in the world. You could then casually walk up and take out one or two more with a knife to the stomach before the remainder realised what was happening and decided to fight back.

When we made the natural comparison between the AI we were seeing and the poor AI from the original Soldier of Fortune, we were assured it was a bug with the implementation of God mode. Uh huh, we certainly hope so, especially after being assured on numerous occasions that AI for Double Helix had been heavily re-written and was aeons ahead of AI in the original.

SoF2 maps are luscious, especially the jungle maps. Walking through an especially overgrown patch of South American jungle, eyes on stalks watching for any movement that could give away an enemy position, our character was cut down in a hail of gunfire from a prone Prometheus soldier lying at his feet.

Soldier of Fortune II is due to go gold sometime in the next month or two. When it does you can be sure that we'll put it through its paces and see if the final game lives up to the hype.

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■ GeForce4 MX Cheap and bloody quick	■ GeForce3 Ti Performance at a price
■ Medal of Honour Two words: Nazi dogs	■ Return To Castle Wolfenstein Nazi Zombies are like Nazi dogs, but crap
■ Telstra ADSL Fast and reliable at last	■ Telstra ADSL It's just a pity no-one can afford it
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Ashton Mills isn't too old, but he's crusty enough to get nostalgic about the summer days of Usenet.

'Wouldn't it be sad to lose this wealth of (sometimes) knowledge? Sure, we'd all be glad to wave goodbye to the morons...'

Almost everyone's heard of Usenet. It's one of the most remarkable collections of discussion our kind has ever seen, sometimes filled with wise knowledge and invaluable information, sometimes spam, and sometimes just the ramblings of truly demented people. But overall, it's a fantastic resource.

Want to find a fix for that obscure problem with your video drivers? Search Usenet. Don't believe the product hype from a manufacturer? Search Usenet for people who have used it and get real world opinions. A fetish for giraffes? Why not? Post a message on Usenet and share your desires with like-minded fellows! Usenet is one, big, worldwide bulletin board that is a key source of support, knowledge and human self expression.

The history of its evolution has been shaky and at times uncertain, but it is up there as one of the key components, and bandwidth hogs, of the Internet along with email, Web browsing and file transfers. It makes the collective mind of the online society go round, with tens of thousands of discussions occurring all day, every day. In fact, over half a gig of pure text (let alone the space occupied by images) is generated *every single day* on Usenet across some 36,000 newsgroups.

There are newsgroups to cover just about any topic you can possibly imagine, even in your most drug-affected moments: from the usual lifestyle, entertainment, and technical groups such as alt.sports.soccer, aus.dvd, the alt.religion top level, the microsoft.public top level or alt.comp.periphs.videocards.nvidia; through to the niche topics such as alt.animals.llama or alt.games.video.xbox; the truly bizarre and comical such as alt.christnet.sex.fetish.fat.furry.asian; and the famous alt.wesley.crusher.die.die.die.

Yegads, there's even an alt.sex.fetish.linux group – one for Brad methinks! If you can imagine it, no matter how truly earthshatteringly useful or perversely sickening, chances are there's already a newsgroup dedicated to it.

Wouldn't it be sad to lose this wealth of (sometimes) knowledge? After all, messages on Usenet must 'expire' as the servers that partake don't have unlimited storage space. Sure, we'd all be glad to wave goodbye to the spam, the trolls, and the really annoying morons which inhabit Usenet just as they do in every other online entity (gaming and message boards especially), but even these posts are a snapshot of our culture and history, and therefore in some way valuable in their own right.

And so it is that Usenet started to be archived many years ago by a rare few forward thinking people such as Harry Spencer, who wrote one of the first programs to read and post news. When he started his archive he worked at the University of Toronto's Zoology department.

At this time, just a handful of machines swapped messages over 300 baud modems, and Usenet was backed up to large magnetic tapes. At the time a mere hobby, the archives grew and were stored in the Zoology department for ten years before the archiving stopped.

In 1995, DejaNews – a Web front end to Usenet – began its own archive. Last year, Google bought DejaNews out and then tracked down Harry's tapes, painstakingly restoring them with ancient hardware. To fill the gap between 1991 and 1995, Google contacted Juergen Christoffel of the German National Research Center for Information Technology, and Kent Landfield, a network security developer, both of whom had kept their own backups during the '90s. Now, Google claims to have stored 95% of Usenet since its beginning, a massive 700 million messages. Phwor!

And this is why it's important we treasure our past. Head on over to www.google.com/googlegroups/archive_announce_20.html to see a timeline Google has made pinpointing first posts relating to various events. There you will find the first mention of Microsoft (1981), first review of an IBM PC (1981), first thread about AIDS (1982), first mention of a fax machine (1983),

Richard Stallman's post about GNU (precursor to open source, 1983), first mention of Microsoft Windows (1983), first thread about Chernobyl (1986), first mention (and inception) of IRC (1989), Linus Torvalds' post that started Linux (1991), the first mention of Osama Bin Laden (1993), and the first threads relating to September 11 last year. Every single one of these is fascinating to read. Now, if you're an oldie and have been using the Internet – and posting on Usenet – for some time, you can search Google's archives for your name and look up your personal online history for a bit of nostalgia.

If, perchance, Usenet is new to you, fire up a newsreader or head on over to any Web based front-ends, including Google, to browse the groups.

You'll be surprised, not to mention amused, by what you find.

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Pointless – that's the point

A monk asked Jomon when he was benching a RADEON: 'What is Buddha?' Jomon said 'this RADEON scored 4,500 3DMarks'.

'What is it you see? A motherboard or the sun, its name is nameless.'

Tech support sucks. Anyone who has been at the business end of an irate call from some late-middle-aged goon who refuses to believe that it was them running the attachment called 'hot_pix.exe' that rooted their PC, and insists that you fix it from your booth three thousand kilometres away by sheer force of will while they insist on double-clicking instead of right-clicking when you ask them to, will know what I'm talking about.

Gee – can you tell I used to do tech support myself many moons ago? Do I sound bitter?

Yet it is these noble souls who step-by-step us through our most trying times – just when you are about to don your meat hat and thrust your hard disk through your monitor – who deserve our highest praise. This is because tech support sucks.

The reason it sucks is because it is really hard, even if you happen to be lucky enough to be sitting in front of the offending PC. It's even harder if you are using some PC putz as your proxy.

This doesn't mean there is no reward for doing tech support. In fact, there are some who get great rewards from shooting trouble, and it's not just that warm fuzzy feeling you get from helping people, but something more transcendental.

Not many people know this, but the online Microsoft Knowledge Base is actually run by a bunch of Zen monks, living in a remote monastery (with a phat pipe) in the mountains around Ashoro in Japan. These monks' chosen path to Nirvana is through the medium of troubleshooting. These are the same monks who made the sand mandala of a Pentium 4 core, wrote *Troubleshooting and Zen for Dummies*, and who have trained some of the best technical support minds in the world.

I have had the privilege of meeting some of the enlightened students of these monks, and they imparted a few very illuminating stories that should be of help to you when it comes time to figure out why your PC chose to blue screen at a particularly critical time, or what the hell that DLL does that just caused an Illegal Operation in GDI.EXE.

The monastery was originally founded by an esteemed Zen Master, Jomon, who initiated the specialised practice of Troubleshooting for Buddha when one of his students approached him with a faulty motherboard.

The student asked 'Oh Jomon, can you tell me what is wrong with my motherboard?' to which Jomon answered 'you'. The student was instantly enlightened.

There was a time when another monk entered the temple in search of enlightenment, and the solution to a fairly nasty driver conflict. He approached one of the masters, Musen, and said 'I have travelled many miles to come to this monastery to learn from you'.

Musen asked 'Have you set up your PC?'

The monk replied 'I have installed many applications'.

Musen said 'You had better defrag', and the monk was enlightened.

Only recently, there was a conflict brewing between two monks over a GeForce3. Jomon was absent from the monastery at the time, so another master Shozon mediated. Shozon took the GeForce3 and said 'If either of you can say a good word, you can take the GeForce3'. Neither of them answered, so Shozon broke the GeForce3 in half.

When Jomon returned to the monastery Shozon told him of the incident, and Jomon removed his sandals, placed them on his head, and walked out of the room. Shozon said 'If you had been there, you could have saved the GeForce3'.

Another time, a monk asked Shozon 'What is Buddha?'

Shozon answered 'A null-modem cable'.

There is also the time when everyone in the nearby village started to go crazy and install Linux, except for Hasan, who continued to run Windows. After the crazy villagers continued to scream and holler at Hasan, and refused to listen to his empassioned pleas about their insanity, he asked Jomon what he should do. Jomon told him to install Linux, and Hasan once again joined the village, and was loved.

The final story I heard was when a monk approached Jomon as he was installing XP. The monk asked 'What is enlightenment?', to which Jomon stood up, straightened his back, and looked towards the sky in bliss. The monk was stunned, for he had seen Nirvana. He then said 'I know what enlightenment is, but now what?', to which Jomon sat back down, and continued with the install. The monk was then truly enlightened.

There are also many puzzling koans, or Zen riddles, which are said to have started at the monastery, including classics like, 'how blue is a blue screen?', 'what is the sound of a hard disk crashing' and 'RTFM'.

So, next time you call tech support, take a moment, and look into yourself. There is usually far more to their words than first meets the eye. You never know, you might even finding yourself staring into the bleak infinity and embracing Godhead – and getting that IRQ sorted to boot.

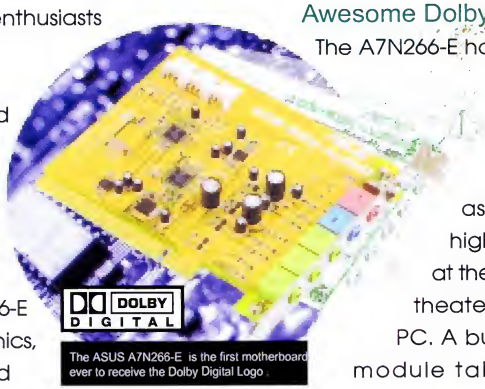
And don't forget to right-click.

Hot Motherboard Trends

ASUS A7N266-E: More features, more performance, more value!

Motherboard manufacturers have long been trying to incorporate as many features as possible onto the motherboard to increase overall functionality and value. Integrated features such as onboard graphics, audio, and LAN save consumers a lot of money by negating the cost of additional add-on cards. Although there are many integrated motherboard solutions targeted at low-end and value systems, their performance and features don't meet the requirements of hardware enthusiasts and gamers. Now there's hope.....

Introducing a revolution in motherboard technology, the ASUS A7N266-E. The A7N266-E is the first motherboard to offer complete integrated features without sacrificing performance. Built upon the advanced NVIDIA® nForce chipset architecture, the A7N266-E features powerful GeForce2™ 3D graphics, Dolby Digital 5.1 audio and integrated LAN for an all-in-one solution with exceptional performance and value for AMD socket A processors.



The ASUS A7N266-E is the first motherboard ever to receive the Dolby Digital Logo.

Revolutionary System Performance

At the core of the A7N266-E, is NVIDIA's 420-D advanced chipset architecture. It includes 128-bit TwinBank™ DDR Memory Architecture for ultra-fast memory processing, Dynamic Adaptive Speculative Pre-processor (DASP) to boost CPU efficiency, and HyperTransport™ for improved I/O bus performance. The result is one of the fastest platforms currently available.

Stunning GeForce2™ Graphics

Compelling 3D gaming right out of the box is possible thanks to integrated 32-bit NVIDIA® GeForce2™ graphics. This is the same award-winning graphics engine found in mainstream GeForce2™ AGP cards, powerful enough to handle the needs of everyone except for the most extreme gamers. Fortunately, the A7N266-E includes an AGP slot for flexible upgradeability to cutting-edge technologies like the ASUS V8200T5 GeForce3™ Ti500 graphics card.

GeForce2™ graphics onboard!

Awesome Dolby Digital Audio

The A7N266-E has the distinction of being to first motherboard to receive the Dolby Digital Logo.

The Dolby Digital Logo, assures users that the same high-quality sound they hear at the movies and in their home theaters can be heard on their PC. A bundled ASUS ACR audio module takes advantage of the motherboard's embedded Dolby Digital Interactive Content Encoder, enabling 3D positional audio and Dolby Digital 5.1 channel audio for true cinematic experiences in DVDs or games. The A7N266-E's integrated Dolby Digital audio is competitive with even the most advanced add-on cards.

Incredible Value

Any way you look it at, the A7N266-E offers exceptional value for those looking for a motherboard with tons of features and performance. In addition to the powerful GeForce2™ graphics and Dolby Digital 5.1 audio, the A7N266-E has onboard LAN for easy network and broadband connectivity. By packing all these features onboard, over $100 USD is saved from overall system costs. Add in the free 3D game software bundle, along with the ASUS' reputation for uncompromising quality, it's easy to see why you should consider the A7N266-E as your next motherboard.

Assault 'n battery

Batteries don't last forever: they get old, depressed and... the Government takes them away. No thanks for the memory (effect), says Daniel Rutter.

'You can't just chuck them in a bin... you're meant to take them to a recycling centre. Which, helpfully, probably doesn't exist'

I have heard people explain that the nickel metal hydride (NiMH) battery of cordless drill X is superior to the nickel cadmium (NiCd) battery of cordless drill Y, because NiMH has no 'memory effect', but NiCd does.

I've heard other people talk about how the Lithium Ion battery in their laptop's better than NiMH because Lithium Ion has no memory effect, but NiMH does.

I have yet to hear anybody extolling the virtues of running your cordless drill from a truck battery, because lead acid batteries don't have memory effect but everything else does – but I'm sure someone has (probably someone with an impressive collection of trusses).

People have strange religious beliefs about the rituals that must be performed to exorcise the Memory Monster. If they were just dancing around their laptop, MP3 player or cordless drill waving incense sticks then I wouldn't care, but they're usually doing unnecessary charge/discharge cycles. Which is bad.

If you flatten a battery before you recharge it – which some people do manually, and which some chargers do automatically – you greatly reduce the life of the pack. A given pack may last for 500 full cycles, or 2000 partial ones. If you're fully flattening the battery by actually using it, then fair enough, but flattening it as part of the recharging process is goofy.

'Memory effect' is now used as a general term for anything that makes a battery not deliver its full capacity, but originally the term referred to a phenomenon that's probably never actually been observed in consumer hardware.

True memory only happens in sintered plate NiCd cells (which aren't the kind used in consumer gear), and it only happens when you precisely discharge a cell to exactly the same level over and over again, then recharge it without any overcharge. True memory effect happens in satellite power systems, electronics test labs, and practically nowhere else.

Cheap trickle chargers always overcharge if you leave them long enough, and quality consumer NiCd chargers also slightly overcharge, because the slight voltage drop that happens when you do that is what they use to pick the end of the charge cycle. So even if you're using sintered plate NiCds – which you're very probably not – your charger will cure memory effect anyway.

What people nowadays call memory effect is a combination of two things.

One: cell aging. Batteries don't last forever. The older they get, the less capacity they have. Live with it.

Two: 'voltage depression'. Voltage depression is a problem with NiCd batteries and, according to some sources, also with NiMH, and it doesn't affect the battery capacity much at all. Rather, the battery voltage drops unusually quickly as it discharges. Gadgets that monitor their batteries, therefore, think the batteries are flat earlier than they should. There may be lots of capacity left at the slightly depressed voltage, but the gadgets don't know that and flash their 'low battery' warnings.

Fully discharging cells cures voltage depression, but if you fully discharge a whole battery then the stronger cells in the battery will 'reverse' the weaker ones. The weaker ones go flat first, and then get charged backwards by the others with some power to spare. This is very bad for the weaker cells, and will kill a battery pack quick smart. So don't do it.

Radio control enthusiasts often cell-by-cell discharge their battery packs in order to be able to achieve the absolute maximum super-punchy charge, but they often then go on to use that whole charge up in five minutes or less. If you've never welded a battery connector through overcurrent, then you're not in that class.

When people cycle their batteries for no reason and kill them early, they have a problem. Rechargeable batteries are hazardous waste.

You're not allowed to just chuck them in the bin. You won't get a Nazi deathsquad beating on your door, but you could face a hefty fine. Not to mention you'll have your conscience to deal with, which will keep reminding you how you've just done your little bit to help destroy this fragile ecosystem we call the Earth.

Instead, you're meant to take your dead batteries to a recycling centre.

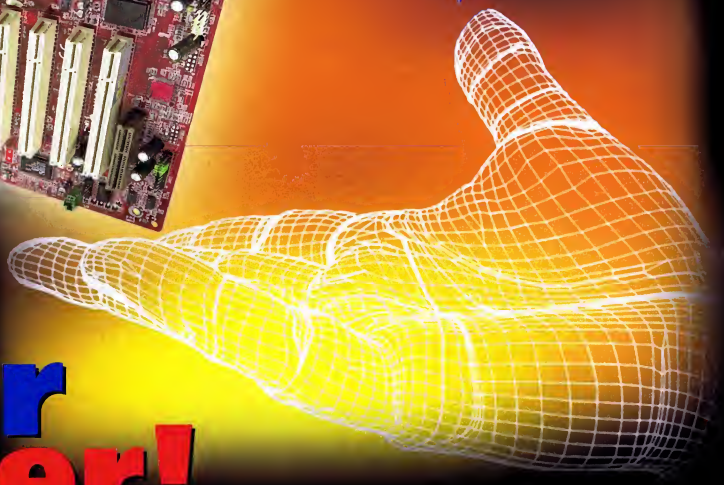
Which, helpfully, probably doesn't exist. Or if it does, it will require a flight to get there.

Various places that sell lead acid batteries will accept them for recycling, but if you want to get rid of ordinary loose cells or consumer battery packs that use the other rechargeable chemistries, there's nowhere in Australia to go. The Government requests that you just put your dead rechargeables in a box, for the time being, until it comes up with a solution.

If you don't want to do that, you can't throw them away – that would be breaking the law and making Australia's landfills even nastier than they already are – so the best idea I've been able to come up with is to subvert the Mobile Phone Industry Recycling Program (www.amta.org.au/recycle).

Collectors send batteries overseas for recycling, and they're only meant to take old phones and their batteries, but I don't believe they have armed guards protecting their recycling bins from people like you. Since one NiCd or NiMH or Lil is much like another, you could just drop the lot in the phone battery bin when nobody's looking.

If you get busted though, I never met you.



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- TV-Out (optional)

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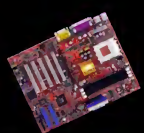

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Technical details

- MSI K7T266PRO2-RU
- 512 Kingmax PC2100 CL2
- AthlonXP 1600+ @ 1900+
- Winfast GF3 Ti200
- 2x60GB RAID 0, 30GB, 40GB
- 16x DVD
- 12x8x32 SONY
- 5x120mm fans
- 2x92mm fans
- 2x80mm fans
- Homemade rounded cables
- 550w Enermax PSU
- Fly screen
- Blue Paint (duh :P)

The story

After looking at various page 18s in atOmic, I decided to mod the cheap 65 dollar full tower case I bought from gamedude. but what colour? Black has been done to death, and red looks too hot. BLUE! Yay! I'd found my colour. After I jigsawed all the holes (do not jigsaw plastic, it melts the plastic onto the blade :S), I painted the case with primer, three coats of blue and three coats of clear, but it still needed something more original.

The race was on to find some type of original add-on for the case. Perspex windows, neon lights, rounded cables and LED boxes have all been mass produced, so they are no longer original. Looking around my workbench, I found an old flyscreen window. PERFECT! I cut it into the necessary shapes and sizes, painted it the opposite colour to the panel it would be on, and just bolted it under the fans! Part dust filter/part finger guard. Right now though, all of the fans are just striped wires shoved into molex connectors.

MODZ LAN box

Technical details

- Athlon 1.2GHZ Axia Tbird
- 512MB Hyundai PC133
- ASUS V7700 GTS DELUXE with custom heat sinks o/c to 280/399
- ECS K7S5A DDR mobo
- Game Theater XP
- 30GBWD 7200 RPM ata 100
- 13GB Seagate 7200 RPM ata 66
- Perspex window
- Green aliens
- Four switch fan bus
- Netgear FA310TX 10/100 NIC
- Nylon carry straps
- Bad-ass Xbox sticker

The story

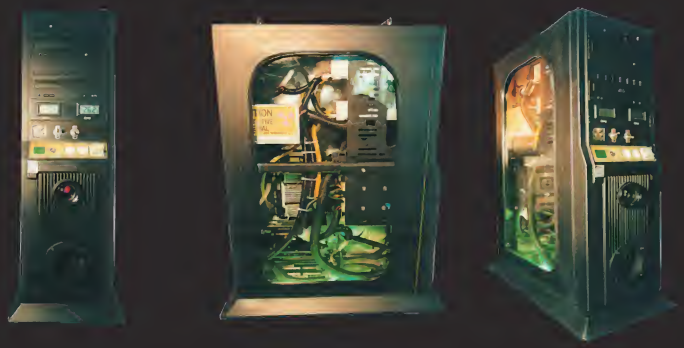
I bought the case off a friend of mine for 70 bucks with a window already cut. After a clean up, I sat down and reinstalled the fan bus – so out came the soldering iron to hook up three fans and the neon. Once this was completed I hooked it all up ready to go. . . and I shorted out my PSU – so I went off to buy a new 400 watt PSU.

After installing the new PSU I realised it had all this power and no where to use it so I promptly installed a 90mm extraction fan to the rear of the case and fitted heat sinks to the V7700 to give it that little bit of extra grunt in the graphics department. Seeing as the mobo I installed has no CPU O/C features as standard, I thought something needed to be overclocked.

After taking a step back from what I thought was a completed box, I realized it was missing something: BADGES – and lots of them. So I got some custom badges from Mael. I added some finishing touches which included lots more stickers and tacky novelty aliens.

Proud of your Hot Box? Send us a pic and you could win a free six-month subscription to Atomic! hotbox@atomicmpc.com.au

Monolith by bellybob



Technical details

- Pentium II 350 @467MHz
- AOpen AX6BC Pro MotherBoard
- 320MB Kingmax PC 133 SDRam
- 32MB Matrox Millennium G400
- Creative SB Live VE
- 20GB 7200rpm HD
- 6.4GB 5400rpm HD
- GlobalWinfast V0S32 CPU Fan
- Twin Senfu Thermal Sensors
- 40x CD-ROM
- CD-RW drive
- 80mm Ported front fan/exhaust
- Custom conduit/rounded cables
- 'HAL Mod' power on eye

The story

I first saw this box gathering dust at a computer recycler's. It was in a sorry state and came complete with a 486. Woohoo! $20 bucks later and it was on its way to the operating room for some major surgery. As it was an AT box a few problems had to be solved to transplant an ATX system into it. A lot of noise, sparks and cursing later and it had a modified back panel, large side window, front suck hole and two alloy handles to carry the heavy plate steel case.

The beige had to go, so on went a few coats of Aluminum paint and then Matt Black. A quick trip to the local wreaker's provided me with enough black conduits and the homemade rounded IDE cables keep the wiring nice and neat, at minimum cost.

After wiring in the green neon light and Senfu Thermal Sensors I decided it needed something to make it different from other modified boxes. I had a broken 50mm camera lens laying around and after a bit of cutting and tinkering the 'HAL Mod' MP3 box was born.

Stadter's Blow Box

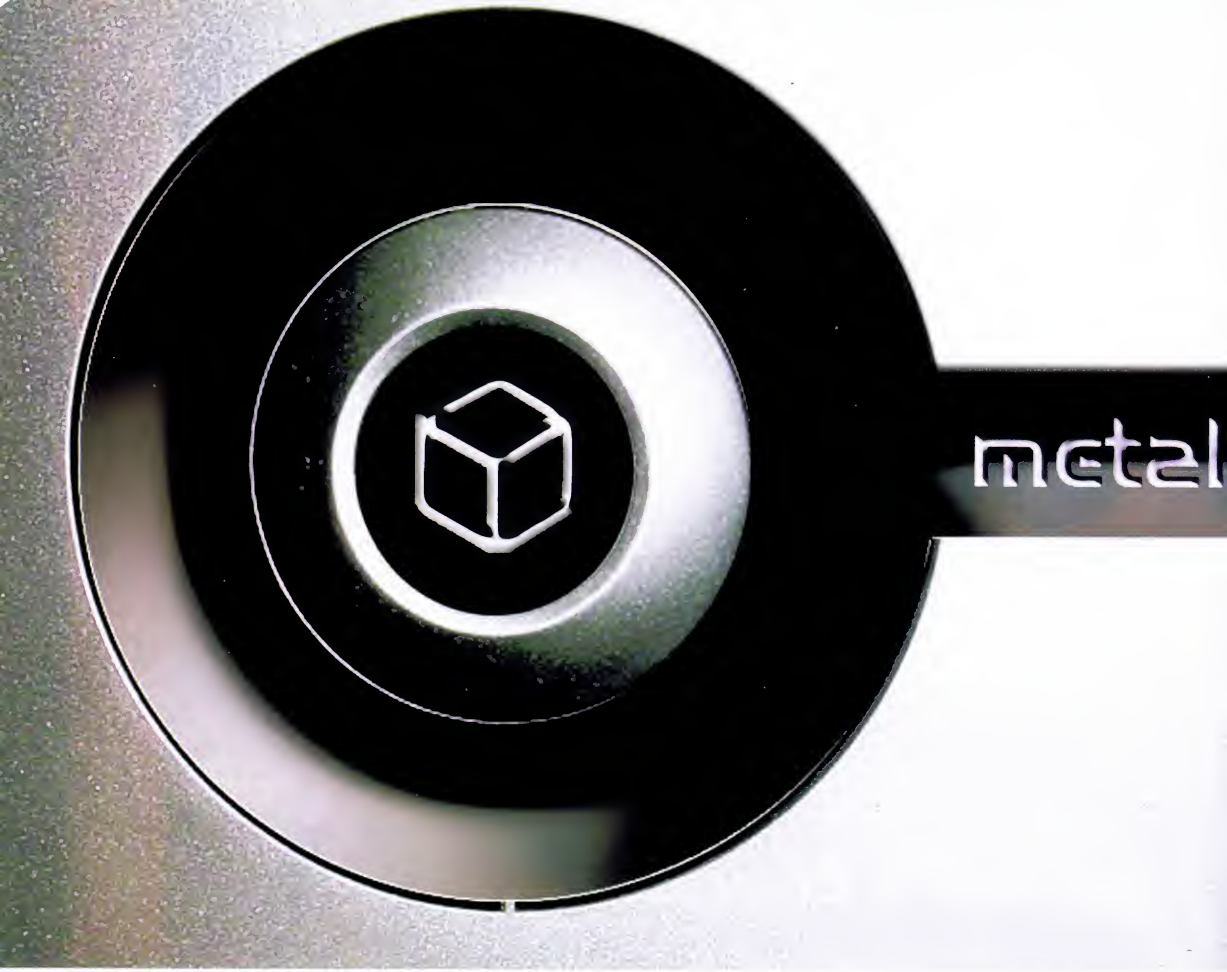
Technical details

- Athlon XP1600+ @1627MHz
- Epox 8KTA3+ Pro (with RAID)
- 512MB PC133 RAM
- GeForce2 MX400 (270/240)
- Fasttrak 66 RAID (4x6GB) RAID 0
- WD 40GB 7200RPM
- WD 20GB 7200RPM
- Hercules Muse XI
- 2x 10/100 NICs
- Mitsubishi 32x10x4 CD-RW
- 40x AOpen CD-ROM
- 2x HDD Caddys
- 22 Fans
- Dual ATX 300w PSUs

The story

.Some of you may remember Chris' Control Freak (Atomic 8), well after that I had the taste for moding and went nuts! I got a plain old el cheapo full tower case and modded it till there was more perspex than case. I got the full tower case and cut holes for fans and put perspex panels on both sides of the case and on top. Then I gave it a full sanding and sprayed on the black paint – inside and out. After about three coats it looked good, then came the fun part of installing all the fans and grills in the holes I made, twenty two fans in total in fact! The drive fronts also all got a good coat of the paint with silver buttons and touches. Inside I whacked in an Athlon XP 1600+, now clocked at 1627MHz to 2.3v @41 degrees idle. Dual power supplies were whacked in to handle the power drain of the fans and overclocked CPU voltage. The final touches were Atomic's Atomic stickers, Atomic's complimentary Xbox stickers and some chrome handles to cart the beast to those all important LAN events.

Proud of your Hot Box? Send us a pic and you could win a free six-month subscription to Atomic! hotbox@atomicmpc.com.au



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The 64-bit question

Bennett Ring asks: 'What do you want 64 bits for anyway?'

With the release of Intel's Itanium processor last year, 64-bit processing finally reached a mainstream level of awareness. That's not to say the actual hardware started storming onto people's desks, but for many PC users it was the first time the concept of 64-bit computing had been brought to their attention. In fact, only a very small number of Itaniums have been sold; a couple of months ago Intel published sales figures for the Itanium CPU that showed only several thousand units had shipped worldwide! But Intel never planned for the Itanium to have widespread appeal; you've got to crawl before you walk, and the Itanium was Intel's first 64-bit baby.

What does 64-bit computing mean?

We first need to define what a word is to a computer. A word is a unit of data that can be can be moved in a single operation from storage to a processor register (the register is a component within the processor that holds data for passing from one instruction to the next instruction). A word can contain an instruction, a storage address, or data from an application that is to be manipulated. Today's PCs operate with a word length of 32-bits, which is equal to 4 bytes. The first 32-bit processor arrived back in 1985 with the release of the Intel 386.

A 64-bit computer simply doubles the length of these words to 64-bits, or 8 bytes. Unfortunately, creating a 64-bit computer isn't just a simple case of replacing the 32-bit CPU with a 64-bit CPU. Everything else within the system also needs to be replaced with components that can handle pieces of data that are twice the size of the old 32-bit chunks. You also need a new 64-bit operating system that makes use of the 64-bit words, as well as applications that can take advantage of the larger word size. This makes the jump to 64-bit computing both very expensive and time consuming. One of the most prohibitive factors is the widespread use of existing 32-bit applications: to make proper use of the 64-bit capabilities every one of these applications need to be recompiled. This explains why, even though Digital released a 64-bit platform all the way back in 1992, 64-bit computing can't be found on the average user's desktop.

The benefits

If it's such a difficult and expensive process to move to 64-bit computing, why bother at all? There are actually several reasons for making the transition to this type of computing:

Larger file sizes

Today's 32-bit computers are mostly limited to dealing with files of 2GB, although with some tricky data manipulation 4GB is possible. 64-bit computing lifts this size to thousands of terabytes.

Larger amounts of physical memory

Currently 32-bit computers can only efficiently handle a maximum of 4GB of physical memory. This is because the pointers that are used to access the different locations within the memory are limited to 32-bit numbers. However, when we use pointers that are 64-bits long, the total physical memory that can be accessed increases to at least 64GB, with several

ABOVE: The Nintendo 64 disguised as a Pokemon hatchery

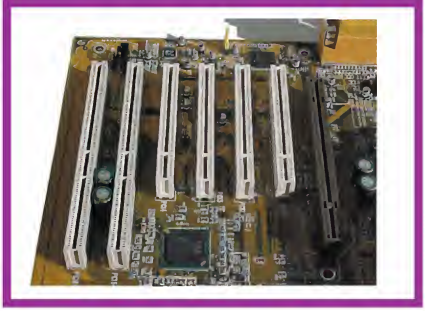
ABOVE: An Alpha, looking very Borg-like

All aboard the 64-bit bus

There is already one component within many desktop PCs that has made the leap from 32-bits up to 64-bits – the PCI bus. In its 32-bit form running at 33MHz, the PCI bus has a theoretical maximum bandwidth of 133MB per second. In the real world, a PC under load passes around 90MB per second across the PCI bus. The move to a 64-bit wide PCI bus as well as an increase of the PCI speed to 66MHz gives the PCI bus a theoretical maximum of 533MB per second, a huge increase over the former speed. If the PCI bus is moved to 64-bits but retains the old 33MHz speed, the bandwidth increases to 266MB/sec.

If the current theoretical maximum bandwidth of a 32-bit, 33MHz PCI bus is 133MB per second, why is the maximum load in the real world around 90MB per second? The difference between these two figures is known as bus overhead. This refers to the wasted bandwidth used to make the PCI bus function, as opposed to the bandwidth that is used for transporting data over the bus. By moving up to the higher speed, higher bit rate bus, this overhead is minimised, as well as giving the bus more bandwidth to play with. If you've got more bandwidth to play with, it doesn't matter so much that some of it is wasted by the bus overhead. Another benefit of moving to a 64-bit bus is the ability of DMA devices to transfer data in 64-bit segments between the PCI bus and the system memory. This effectively halves the amount of time it takes to transfer burst data when compared to a 32-bit bus.

64-bit PCI devices are more efficient than their 32-bit comrades, as they can get on or off the PCI bus in just half the time of the 32-bit version. Combine these benefits and you can now add a much larger number of PCI devices to the PCI bus without it reaching its full capacity. Much like the leap to a 64-bit processor, moving to a 64-bit PCI bus offers multiple benefits, but still has the problem of OS support. Without an OS supporting 64-bit PCI addressing, the benefits of the 64-bit PCI bus will be wasted.



ABOVE: The long slots on the left are 64-bit PCI slots

terabytes available in the near future! And I thought the 512MB I just upgraded to was heaps.

Larger virtual address space

Current applications can't efficiently access more than 4GB of virtual address space. So how does one million terabytes sound? That's what you'll get with 64-bit computing. Repeat after me – w00t!

64-bit computation

The number range for a 32-bit value can be from 0 through to 2 to the power of 32. However, the number range for a 64-bit value can be from 0 through to 2 to the power of 64. Needless to say, that is one incredibly large number. This gives 64-bit computing the power to process extremely huge numbers without having to break the equation down into smaller chunks, unlike a 32-bit computer. This equals faster processing of larger values.

Who is it for?

At the moment, due to a severe lack in 64-bit applications, 64-bit computing is still a very niche market. Other than supercomputer applications, the first widespread use was within the server market, courtesy of Digital's products. But there are still several tasks that could benefit from the use of 64-bit computers right now.

The first of these, and probably the most widespread, are extremely large database applications. By having such a huge amount of system memory, the entire database can be run from the memory, speeding up access to the data by massive amounts.

Computer Aided Design is another area that will experience tangible benefits by making the leap to 64-bits. In fact, this is one of the reasons Intel had to develop a 64-bit platform. According to Intel "we needed [Itanium] in order to design our next generation chips".

Security and encryption are two more applications that will have a very noticeable performance increase from the use of a 64-bit platform. With the US's relaxing of encryption laws to allow export of US-made 128-bit encryption and above, today's 32-bit platforms must break up these 128-bit keys into smaller chunks to be able to work with them. A 64-bit platform will need to break each equation into much fewer chunks to perform the same tasks, resulting in faster performance of these tasks.

In fact, we can generalize and say that the more complicated the task, the more relevant 64-bit computing becomes. And as we all know, some of the most demanding applications that can be run on the PC just happen to be games. In fact, John Carmack has been calling for internal colour precision levels of 64-bits for a while now.

Gaming consoles, while not using the traditional x86 CPUs we've come to expect in the modern PC, made the leap to 64-bit computing almost 10 years ago, in November 1993. The revolutionary Atari Jaguar had a true 64-bit processor, but was hindered by the overall

ABOVE: Intel's Itanium, in all its chunky glory

ABOVE: Another Alpha machine, far too expensive for you

suckiness of the rest of the unit. Nintendo was next to follow suit with the release of the Nintendo 64. It wasn't called a Nintendo 64 because it had 64 games, cost 64 dollars or was targeted at the age group of 64 month olds, you know. The Sony PS2 has even made an even more impressive (bit wise) leap to a 128-bit RISC processor, but don't expect to be using a 128-bit processor on your PC for a very long time.

I want it now!

When the cost of the hardware drops and a wide abundance of software becomes available, 64-bit computing will finally arrive on the average PC user's desktop. Microsoft has already released a 64-bit version of the Windows XP operating system, so one of the last remaining hurdles to the widespread adoption of 64-bit computing for the average user has been cleared.

It's interesting to see how Intel and AMD differ when it comes to 64-bit computing. Intel's Itanium uses a revolutionary new CPU architecture which has a brand new instruction set known as EPIC (Explicit Parallel Instruction Computing). There are a wide range of changes to this design over the old x86 design, but for the moment all you need to know is that it is natively 64-bit.

The benefit of this is that it does away with all the limitations of the old x86 architecture. But there is a huge downside – running older 32-bit applications on the Itanium will result in lower performance than today's generation of 32-bit computers. Considering that it is going to take a while for 64-bit applications to become readily available, the move to 64-bit computing via an Itanium is going to be a tricky proposition. This is very different to AMD's approach with its Hammer CPU, which is due for release in the second half of this year.

The Hammer is still based around the x86 architecture, but uses what AMD likes to call the x86-64 design. Intel did the same thing in the transition from 16-bit processors to 32-bit processors. The benefits of sticking with the old architecture mean that the Hammer will be able to run legacy 32-bit applications at the same speed as current 32-bit CPUs, if not faster.

At the same time it will also enjoy the benefits of all that 64-bit computing has to offer. As it is based on the x86 design, the trade off is that it will still suffer from many of the problems that now plague the x86 architecture.

The end of the 32-bit world is nigh

With the release of the Itanium and a 64-bit version of Windows XP, as well as the imminent release of AMD's Hammer, it looks as if this technology is on the brink of becoming widely accepted. We think it's more than two years away at least, which seems like an eternity to most computer users, but there is no denying that the shift to 64-bit is going to occur.

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Red Hat Linux vs. Debian GNU/Linux

Ayden 'v0id' Nash taste-tests the two leading Linux distributions, finding different flavours for different needs.

The birth of the Linux kernel in late 1991 pioneered the open source community as we see it today. Over the last decade, as developers all around the world contributed to the kernel and the applications used by Linux, many distributions of Linux have emerged, and one of the most popular and widely publicised is Red Hat. Red Hat Linux aims to provide the business world with a powerful, reliable and user friendly solution to server and workstation environments. Thanks to its wide selection of configuration tools and popular packaging system, Red Hat has taken the Linux community by storm.

Security conscious sys admins may be skeptical of Red Hat, and desire a more secure and powerful distribution such as Debian, a non-company-affiliated project developed by approximately 500 volunteers from around the globe. A major advantage for the Debian project is that it does not face any pressures to bring out newer releases, and therefore it is extensively tested and developed before being released to the public.

Red Hat might not require the same level of experience with Linux operation and administration, but most experienced Linux users agree that Debian is worth the time, effort and steep learning curve.

Installation

For many years Linux distributions were notorious for their lengthy and challenging installation procedures, especially for users whose experience stopped at installing Windows. Red Hat has been successful thanks in part to offering an excellent installation graphical interface (using the XFree86 graphical server), thus making it easier for Windows users to migrate to the power of Linux.

However, don't let Red Hat blind you with user friendliness.

Debian's interface may be less attractive, but the advanced nature in which it allows you to configure your applications provides a far more secure environment than Red Hat.

By selecting packages and configuring them to your needs, you can dramatically increase your system's performance and integrity, not to mention individuality.

From the main Debian installation dialog you can jump to any steps of the installation process, a feature not supported by Red Hat's linear installation design. This feature comes in handy when having to backtrack or change configurations of previous steps.

The interface Debian uses to select individual packages is far less user friendly and more time consuming then Red Hat's point and click list layout.

Another setback for Debian supporters is its lack of consistent hardware support due to the gap between releases – the latest version (2.2r4) still uses the 2.2 series Linux kernel. For many users, continued support of the distribution is held back by the frustration of having to install drivers for NVIDIA GeForce, Quadro and TNT/TNT2 cards after installing Debian due to the prehistoric XFree86 releases it is packaged with. Red Hat not only provides up-to-date releases of the Linux Kernel, but extremely easy to use hardware detection and configuration applications and wizards. This gives Red Hat the edge it deserves over other distributions.

While Red Hat's use of a graphical server provides an excellent installation interface for all levels of user, the default installations will not be acceptable for the security conscious. In comparison, the installation process of Debian is far more tedious than it needs to be, but it is more configurable and interactive.

Beginners should probably start with Red Hat, and after gaining some experience with Linux make the switch to Debian.

Packaging systems

Linux distributions make use of a packaging system to bundle software together: packages contain an archive of files and the information needed to provide easy installation of software. Red Hat developed a system called Red Hat Package Manager (RPM), which is not only used by Red Hat, but by several other operating systems such as Mandrake, SuSE *BSD and Solaris.

This versatile packaging system has become extremely popular in the Linux world, leading to increased development and testing, and providing Red Hat with a powerful package manager.

Debian packages come with the .deb extension and Debian's packaging manager handles dependencies, installation and removal issues. You can upgrade your whole system by running 'apt-get upgrade' which gets administration duties done on the fly. Red Hat provides the Red Hat Network to upgrade your entire system and 'up2date' handles all your package upgrade installations.

The biggest difference is that RPM uses a binary database and Debian uses text files. This can cause binary file corruption during or after upgrade and prevents you from editing the file directly. Another huge advantage of RPM is that it

also includes a graphical front-end.

In the old days using apt and dpkg was safe, fast and reliable, but these days it is extremely hard to decide which package management system is better – it is simply a matter of taste and experience. In my personal opinion using apt-get is a much better option than RPM, though others may disagree.

Security

Security is one of the biggest concerns from an administrator's point of view in the IT workplace, and when it comes to security, Debian is out on top. Its packages are thoroughly tested before a new release to fix most of the common bugs from user and system applications, especially those that must be set-uid root. Conversely, a Red Hat Linux machine with out of the box security is seen as a joke by the hacker community.

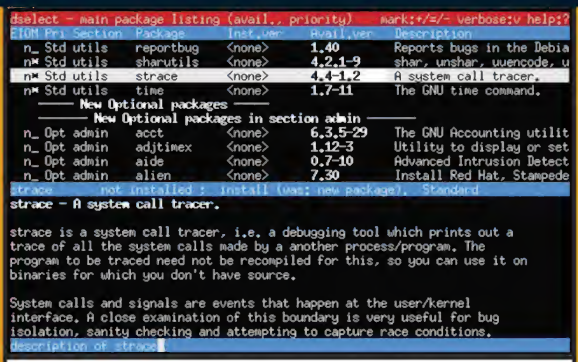
No operating system is completely invulnerable to a security breach. Most distributions came packaged with a kernel <= 2.4.9, which was vulnerable to a kernel ptrace() exec race condition. This meant that any box that had not been upgraded or at least had the kernel patched was vulnerable to a local user gaining super user privileges. Unfortunately, the old series 2.2 release kernel that came with Debian was easier to code this exploit for. Bugtraq (a bug tracking list) was hit with posts about the same vulnerability being potentially resident in kernels as high as 2.4.9, and sample (yet non working) proof of concept code was released. This was later modified and successfully tested on a Red Hat machine of mine running kernel 2.4.2-2.

As a general rule, no operating system can be left unadministered and still be safe from attack. Regular updates and system upgrades should happen every day, as patches, fixes and workarounds are usually released about 48 hours after a vulnerability is reported.

Remote penetration of a workstation, using no listening services what so ever, is impossible. Red Hat provides advanced and well designed office applications as well as providing Sun Microsystems Star Office, making it the wiser choice of Linux distribution for workstation and desktop office use. Debian's out of the box security provides an excellent OS for server and development environments. Its development pioneers that of other mainstream distributions, which says a lot about how new Linux implementations are often developed.

The most common place for a hacker to begin looking for vulnerabilities on a system is by searching for suid root binaries. These binaries are found by the following:

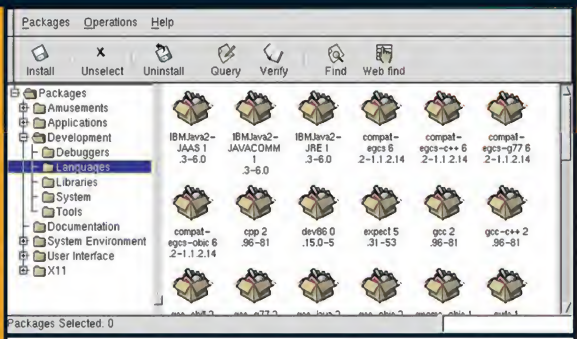
```
opium:/usr/sbin% find ./ -perm -4000 -ls
409085   24 -rws--x--x   1 root     root
20696 Feb 15  2001 ./userhelper
```



ABOVE: One of Debian's greatest assets, the apt-get update utility

ABOVE: Sound config during Red Hat setup

ABOVE: Red Hat's Internet Connection Wizard



ABOVE: Red Hat running the GNOME desktop environment.

410023 28 -rwsr-x— 1 root disk 26888 Apr 5 2001 ./amcheck
410591 228 -r-sr-sr-x 1 10 14 228096 Jan 6 2001 ./uucico
410594 108 -r-sr-sr-x 1 10 14 103600 Jan 6 2001 ./uuxqt
opium:/usr/sbin%

This command will give a directory style listing of all files within /usr/sbin that are suid. It's crucial that you search your entire system for not only legitimate suid files but also suid files that could be used by hackers as a backdoor. In early times, suidperl was vulnerable to root compromise, resulting in many machines coming under attack. A simple work around was to 'chmod -s /usr/bin/suidperl' but other common vulnerabilities such as Red Hat's iputils package vulnerability meant that a person with executable permissions to ping was able to gain root.

To check the package the particular binary comes from issue the following command on Red Hat:

rpm -qf /bin/ping

or in Debian:

dpkg —search /bin/ping

Your result should look something like: iputils-20001110-1, depending on the distribution release, and how often you upgrade.

It would not be wise to use Red Hat packaged daemons for a server environment, because if you do, and a vulnerability is found in the package, you are likely to be hacked. The reason for this is that all the offsets for Red Hat 7.2 will be the same as another box running Red Hat 7.2 and thus be open to the same exploit code. 90% of networks that are hacked have been attacked by kids using canned exploit code they found on exploit archives all over the Internet. Any script kiddie simply needs to check your kernel version (using nmap) and daemon banners (such as httpd or telnetd banners) and he will have the kernel version (for implementing current shellcode) and your distribution version.

So what are the implications if you've used Red Hat's packaged telnetd? Congratulations: it's time to head into your boss' office to tell them that their network has been penetrated and a whole bunch of client material was lost.

On the other hand, if you've used the actual vendors release, the offsets could be slightly different, resulting in you having to modify the exploit code. Quite simply, 90% of so called 'hackers' would not know where to begin. You probably won't stop experienced hackers because they will always be one step ahead.

Constant package updates and patching will help prevent any operating system from being the victim of a penetration. For the security minded, Debian provides just about everything an administrator could want, allowing you to spend less time securing the machine, and more time. . . sitting around? Compare this to the admin load you'll have with Red Hat, and you'll want Debian in your box.

Of course, it cannot be stated enough that no Linux distribution is secure 'out of the box'. Debian may be easier to secure than Red Hat, but that doesn't make it an 'install and forget' OS.

Conclusion

The distribution you select is a very personal choice based on your current expertise and what you intend to use it for.

If you like a powerful server and development environment, you will love the feel and stability of Debian – but if you want to use Linux for a workstation, then Red Hat will provide the best interface and assorted office applications. Red Hat is suitable for people at every level of Linux, while the steep learning curve of Debian may be too much for the beginning Linux user.

I believe Debian handles Linux the way it was intended, as it has grown without the pressure of commercialisation – just a bunch of geeks from around the world contributing, tweaking and adding code to provide a distribution by the people, for the people. So judge what skill level you are at, and give both a try. Trust me, you won't regret it.

Red Hat Key Features:

- **2.4.7 kernel**
- **gcc 2.96-RH**
- **glibc 2.2.4**
- **GNOME 1.4**
- **KDE 2.2**
- **XFree86 4.1.0**

Debian Key Features:

- **2.2.19 kernel**
- **gcc 2.95.2**
- **C library 2.1.3**
- **GNOME 1.0.56**
- **XFree86 3.3.6**

Links

www.debian.org
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www.rpm.org
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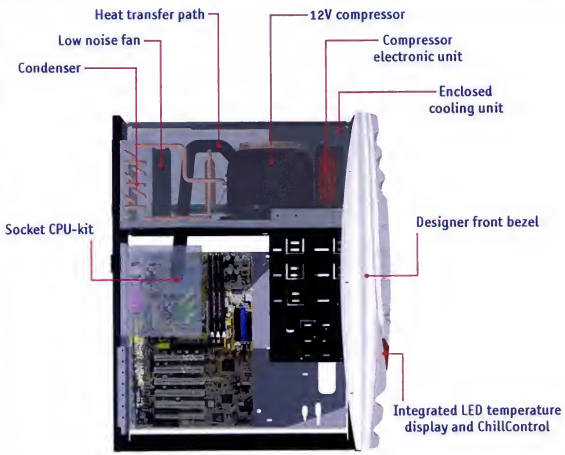

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CHEAP AND FASTY

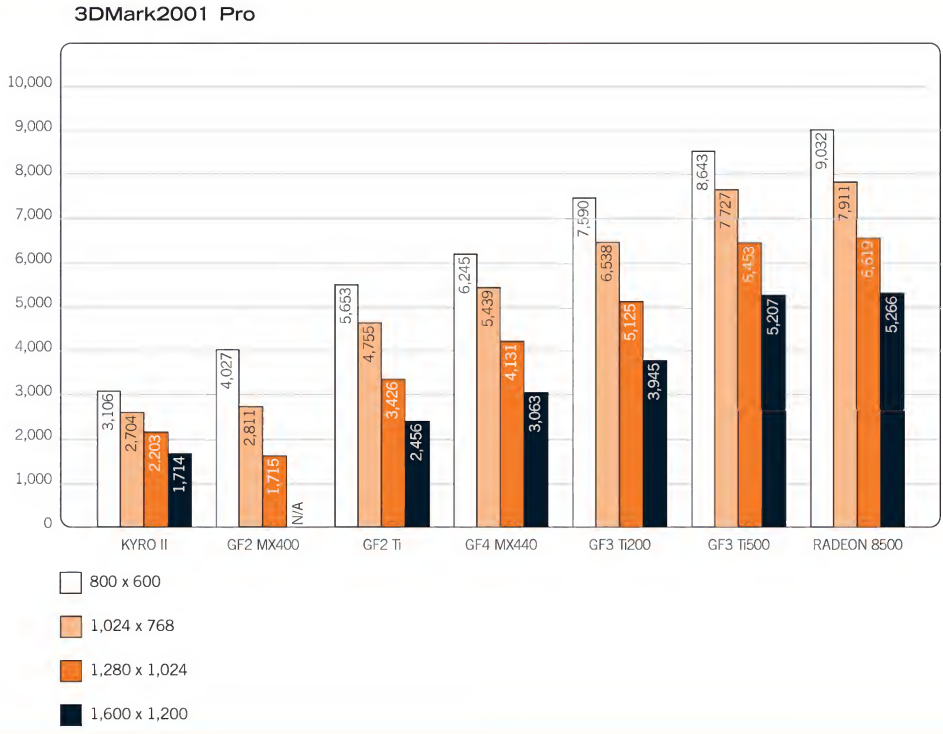
What happens when you have a video card and no tech info? John Gillooly benchmarks it.

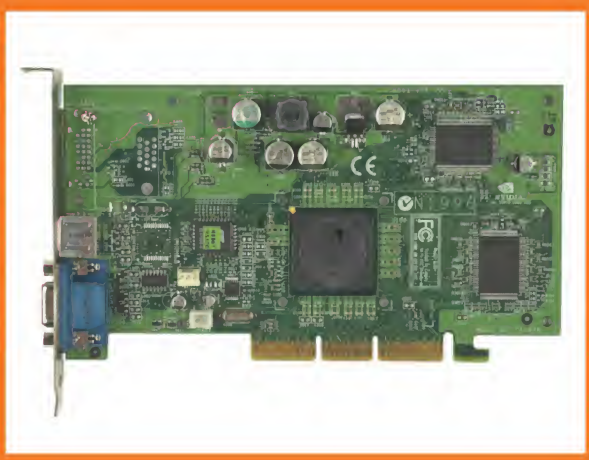
The current 3D tech battle may well be being fought out between the GeForce3 and the RADEON 8500 series of cards, but over the past few years the true 3D champion has been the GeForce2 MX. This chipset is now starting to show its age, but at a time when decent 3D performance was hitting the $800 mark, the GeForce2 MX brought playable 3D back into the mainstream.

Since that point the scene has changed remarkably. Hardware Transform and Lighting is no longer the Holy Grail of the industry. Now it is the next generation Programmable Shaders that are the mark of a high-end card. Even though the GeForce3 Ti 200 can be found for less than $500, it is considered a mid-range card. The MX line needed some shaking up and NVIDIA has delivered this in the form of the chipset formerly known as NV17, the GeForce4 MX. That's right, despite our hopes and prayers, it looks like NVIDIA is pushing the GeForce moniker towards double figures.

While the big news in terms of what comes next is its big brother, the GeForce4 Ti (codenamed NV-25), perhaps the more intriguing aspect is whether the GeForce4 MX can attain the huge sales figures and price/performance heights of the GeForce2 MX. In a strange twist of events, we ended up with a brand spanking new MSI GeForce4 MX440 engineering sample, some recently leaked Detonator 27.20 reference drivers and the promise of all the technological specs for the chipset, a week later.

Fighting our natural urge to either irradiate or set fire to the card, we decided that it was performance that mattered, plugged it into a testbench and stood back. The first thing that struck after installing the drivers was a new feature from NVIDIA called nView. Consider it to be TwinView's





lovechild. This little applet both controls the multiple monitor behaviour of the card and adds some nifty touches to the existing Windows desktop, like multiple desktops and a particularly funky transparent window mode.

When the mobile version of this chipset, the NV17M, was first unleashed late last year there was a lot of speculation as to just how DirectX 8.0 compliant the NV-17 line was to be. It appeared that, while the chipset had vertex shaders, it lacked pixel shaders, which is one major part of being fully DirectX 8.0 compliant. This is borne out by the fact that the GeForce4 MX cannot run the infamous Nature test in 3DMark2001, and also fails the Pixel Shader tests.

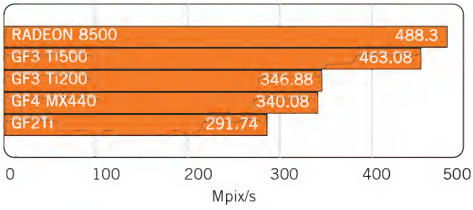
This quandary was clarified when a PDF from heaven arrived in the form of the manual for the card. Inside were the specifications for the card, which showed that the DirectX 8 Lite tag that the NV17M had earned was indeed true. The card sports Vertex Shaders and 24 of the 26 Pixel Shaders needed for full compliance. After betting that the two missing shaders would not be appearing in the Pixel Shader technical demonstration that is to be Doom 3 and were therefore irrelevant, we continued the testing.

Despite the inability to run the nature test, 3DMark2001 Pro is still the standout DirectX 8 benchmark and the ideal place to see just where the new MX slots into in the heated 3D chipset race. If we follow the logic behind the original GeForce2 MX then we expect the GeForce4 MX to hover at around GeForce3 speeds.

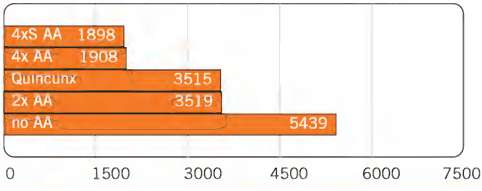
3DMark2001 showed that this is not entirely the case. Despite being much quicker than the GeForce2 MX, it is only slightly ahead of the GeForce2 Ti and well behind the high-end battle between the GeForce3 Tis and the RADEON 8500. When you realise that the GeForce4 MX 440 is only the mid-range model, the performance starts to look pretty tasty indeed. Plus, remember that 3DMark2001 does penalise cards for being unable to run the critical nature test.

Next up was Fillrate. This also gave us our first chance to use the demo of Serious Sam: The Second Encounter as a benchmark. Since the original game, there have been enhancements to the engine and

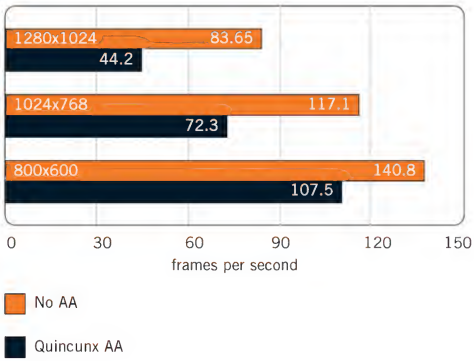
Serious Sam: SE Fillrate benchmark



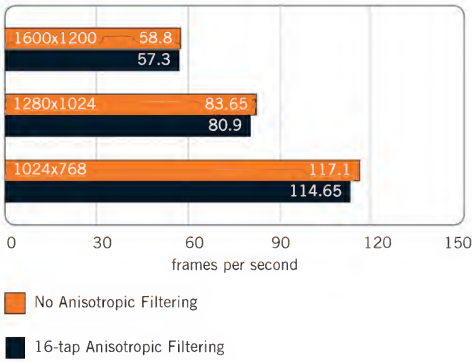
3DMark2001 Pro - GF4 MX440



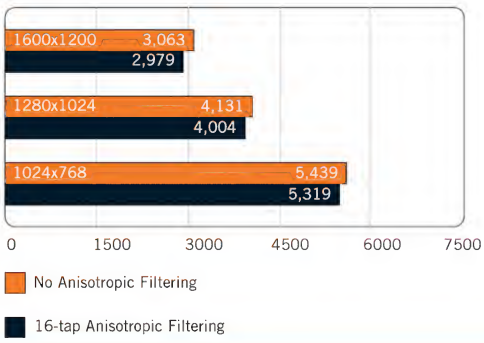
Quake 3: Arena - MAX



Quake 3: Arena - MAX



3DMark2001 Pro



it provides a more up to date look at OpenGL performance than the useful, but now aging, Quake 3: Arena. In this instance it was the Synthetic Fillrate benchmark we were after, the results of which show the GeForce4 MX sitting behind the GeForce3 Ti 500 and RADEON 8500, but almost neck and neck with the GeForce3 Ti 200.

Smoking Mojo Filters

These results were great, but we were secretly let down that the card wasn't some sort of low price GeForce3 killer. Knowing that some other graphics companies have an almost unhealthy obsession with actually being able to run special features at playable speeds, we delved deeper into just how well the GeForce4 MX440 handled the notorious frame-stealing duo, Anti-Aliasing and Anisotropic Filtering.

As mentioned before, Quake 3: Arena is still a very handy benchmarking tool (opinions differ in the Atomic labs about the gameplay, but let's leave that alone). Using the Atomicmpc demo we delved into how well Quincunx is faring on this chipset. The hit in performance when running Quincunx is the first noticeable thing on the graphs; however the frame rates being delivered are still highly playable. Being able to actually play Quake 3 at 43 frames per second, with Anti-Aliasing on, at 1280 x 1024 maximum detail on a budget card is unheard of, and is reminiscent of the effortless way in which the GeForce2 MX used to run Quake 2 engined games when it hit the market.

Returning to the world of Direct3D, 3DMark2001 Pro was then used to test the range of Anti-Aliasing methods available in the 22.70 drivers. The only new addition is 4xS, which appears to be the next level of Quincunx and currently is only available under Direct3D. In the performance tests, the picture shown is similar to what we saw with the GeForce3. The hit seen with 4xS AA benchmarks like a 4x AA version of Quincunx, which has superior visual quality to 2x Ordered Grid Super Sampling techniques but gives the same performance hit.

After such a good run with Quincunx, we were feeling pretty cocky about the card, and it was time to see how it dealt with Anisotropic filtering. In the drivers and via the latest version of NVMax the only available method was level 2 (16-tap) filtering, which does make a noticeable visual difference.

Now, there are very few places on the planet, maybe even the universe, where much w00ting and jumping around accompanies the finish of a benchmark run, but the Atomic Labs was one of those places when the Anisotropic-filtering run finished. From experience and reference tests, this level of filtering gives a hit of around 1000 3DMarks in 3DMark2001 on a GeForce3. When we ran the

Chipset	Core Speed	Memory Type	Memory bus speed	Memory (effective)
GeForce2 MX200	175MHz	SDR	166MHz	166MHz
GeForce2 MX400	200MHz	SDR/DDR	166MHz	166MHz/333MHz
GeForce2 Ti	250MHz	DDR	200MHz	400MHz
GeForce2 GTS	200MHz	DDR	166MHz	333MHz
GeForce3 Ti 200	175MHz	DDR	200MHz	400MHz
GeForce3	200MHz	DDR	230MHz	460MHz
GeForce3 Ti 500	240MHz	DDR	250MHz	500MHz
GeForce4 MX420	250MHz	SDR	166MHz	166MHz
GeForce4 MX440	275MHz	DDR	200MHz	400MHz
GeForce4 MX460	300MHz	DDR	275MHz	550MHz

'Being able to actually play Quake 3 at 43 frames per second, with Anti-Aliasing on, at 1280 x 1024 maximum detail on a budget card is unheard of'

GeForce4 MX440, the hit was only in the order of 100 3DMarks. When the tests were run using Quake 3: Arena the performance hit was even smaller, running in the range of a mere one or two frames per second.

Naturally this caused a fair amount of disbelief and scepticism, and ended with some close staring at screenshots and retesting. The shots showed quite clearly that Anisotropic-filtering was indeed being done during the tests, something that is frankly astounding and is going to be a big asset of the GeForce4 MX and hopefully the GeForce4 Ti, besides its other tricks.

Hold me back

With the performance sorted it was time to have a look at the card itself. Now this is one of the first engineering samples of MSI's G4MX440 line of cards, so it comes on a standard green PCB rather than the funky red that final cards will ship with. The board comes with a snazzy gold HSF for the GPU, but it appears that the RAM chips will not live in the shadow of Ramsinks (in this model at least).

The G4MX440 comes with RAM running at an effective 400MHz (200MHz DDR). With such fast RAM one would expect that this supposed budget chipset would end up being priced up in the range of the GeForce3 Ti 200 cards. If this were the case, then the idea would be to forget the GeForce4 MX440 and just go for a GeForce3 Ti 200. This quandary was short lived, as the sound of the phone ringing was soon followed by a recommended retail price of $290.

This RAM is so quick it Mega Hurts!

That clinched it for us. The GeForce4 MX440, at that price, has all the ingredients needed to be as successful as the GeForce2 MX.

It is great to see that, after the spiralling video card costs over the past year, NVIDIA has again offered us a budget solution that doesn't suck. With the KYRO II still floundering without Transform and Lighting, the RADEON 7500 lacking any programmable shaders and the other budget chipset makers still striving for GeForce2 MX level performance the GeForce4 MX is the way of the future. Even this mid-range model is fast, cheap and powerful. What more do you want? It even stopped us from setting fire to it.

Beige busters

John Gillooly always suspected his one true love would be square and made from aluminium.

The shift away from the world of beige has been coming for a while. For years cases have been painted, coated in fabric or otherwise cosmetically altered in order to get away from the beige hell that we used to suffer under. The popularity of aluminium cases is perhaps the biggest flow on from this mindset. Kicked off by Taiwanese manufacturer Lian Li, these shiny, silvery beasts have become the case of choice for those who want style and aren't afraid to spend.

Pricing is still the major stumbling block with aluminium cases. Compared to normal steel cases they are often more than double the price, which is a major turn off, considering that cases are usually one of the cheapest parts of a new system. The flow on is also that aluminium cases are seen as high risk for case modding, almost purely because it is much easier to deal with accidentally rendering a $100 cheapo case into a useless heap than a $400 aluminium one.

Not that many aluminium cases need modding. Besides looking good, the standout feature of cases like those made by Lian Li and Cooler Master is attention to cooling. Rather than relying on the PSU fan and maybe one extra for cooling, these cases show a great attention to thermal design. The aluminium also allegedly helps with cooling, however the jury is still out on this, and it is much more likely that the lower internal temperatures seen in tests are a result of the added cooling fans than the influence of aluminium.

In the end choosing a case is going to come down to personal opinion. Some people will be after looks above all else, but others will want ease of access, or modability, or cooling. In order to simplify this we have pulled together an assortment of the aluminium cases currently available, taken some nice big pictures for the looks lovers and given the cases a good working over for the functionality fans.

There are several aspects that we have focused upon. For anyone who has spent some time tooling around inside their case, you would know the nasty tendency to finish the job with small nicks and cuts all over your hands. This affliction is common and is largely a side effect of poorly thought out case design and construction.

Despite the importance placed upon cooling in modern systems, few people really appreciate the need for a well-designed case for this purpose. Why go to all the effort of hacking holes in the case, when you can have all your case cooling pre-designed by people who have hopefully spent some time thinking about things. Similarly, some cases appear to have decent solutions, but in practice they fall down because of unintelligent fan placement and intake design.

There are other, more intangible things related to design that are important when looking at cases. If you are planning on taking the modding plunge, the positioning of metal bracing and the like comes into play. After all, you cannot fit extra fans if you don't have enough room to hack a hole in the case, or if the hole you hack destroys the structural integrity of the case. Ease of access is another factor. A case may look fantastic, but if you have to perform superhuman contortions to just install a disk drive then the aesthetic appeal of the case wears off fairly quickly. We have taken several motherboards and looked at how well they fit into the cases, especially once the drive bays are occupied.

Lian Li

Web Site: www.lian-li.com
Distributor: Anyware www.anyware.com.au (02) 9879 5788
Supplier: AusPCMarket www.auspcmarket.com.au (02) 9817 2899

Undoubtedly the parent of the Aluminium case craze, Lian Li has been incredibly successful in changing the case buying mindset. When the cases first started filtering into the country, the major complaint was how expensive they were. This was altered thanks to the combination of looks, cooling and user friendliness that the cases offered.

There is now a huge range of Lian Li cases out there. The most well known is the PC6x series but there are two other series that we have looked at: the PC3x and PC7x.

The series range in size and number of drive bays, but there are a lot of common design elements between them. Aside from the drive mountings, the cases employ an entirely tool-less design, thanks to the extensive use of thumbscrews. This is part of a philosophy that makes the Lian Li cases some of the easiest to work in.

Removable motherboard trays are an often-underrated part of a case. The ability to mount all the fiddly pieces of hardware outside the confines of the case is a blessing, especially for us hardware nuts that love swapping components with reckless abandon.

All the Lian Li cases included here use removable trays, which are a joy to use and feature nifty touches like an extension plug for the motherboard power and LED headers.

To further facilitate the warm fuzzy glow that comes from system building in a well-designed case, the potentially nasty inside edges are partially covered by a plastic strip that prevents the more common cuts that would come from system building. There are still uncovered edges, and these can deliver some nasty nicks, but by and large, as long as the plastic edging stays in place, so will your precious blood.

Cooling is another important part of the Lian Li design. Whilst the jury is still out on the effect of the aluminium in cooling, what does have an effect is the two front mounted intakes and one rear outtake (two in the case of the PC7x). The front fans feature three levels of speed adjustment, allowing you to choose between an arctic blast or soft breeze flowing through your precious system.

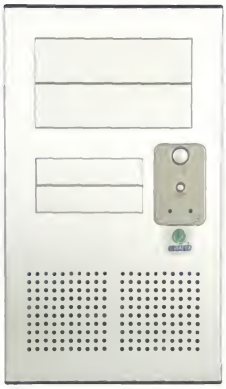
PC3x

Price: PC3x series $264 - $286 (no PSU)

This is the baby of Lian Li's normal ATX range. Currently a popular choice as a LAN box, the PC3x comes in two main colours, the classic brushed aluminium style PC30 and the black PC31.

These boxes are big enough to fit an ATX motherboard, and manage this trick by mounting the PSU on its side, sitting directly above the CPU on the motherboard. This is not the ideal cooling situation, especially if you have a dual fan PSU. A fan sucking out is not the best thing to put above a fan blowing down. At least, thanks to the removable motherboard tray, the PSU does not impede any work on your system,

The smaller size means that the case only has two 5.25in drive bays, but Lian Li has still managed to fit two external and four internal 3.5in bays into the case.



PC6x

Price: PC6x series $363 - $423 (no PSU)

By far the most commonly sighted Lian Li cases come from the PC6x line. Roughly equivalent to standard ATX medium tower cases, the PC6x provides enough space for most systems. The range differs mainly in faceplate design, however the PC65 features a preinstalled Perspex panel, and the PC61 comes in black.

These cases are incredibly roomy, and a joy to work in. The preferred location for your hard drives is mounted vertically in a small removable bay. This sits the drives right behind your main intake fans and is a highly effective way to keep them cool. Most models feature four front USB ports, which connect to the USB headers featured on most modern motherboards. The let down is that they do not feature the extension plug seen on the other motherboard connector.

PC7x

Price: PC7x series $489 - $517 (no PSU)

Sometimes the English language lets you down when searching for the right term. Big arse just doesn't cut it with the PC7x series: these cases are gigantonormous. With the PC7x, Lian Li has taken the basic PC6x design and blown it out to make a case that will fit pretty much anything you throw into it.

This translates to three external 3.5in drive bays, six internal 3.5in bays and six 5.25in ones. The internal 3.5in bays sit in an expanded version of the PC6x vertical drive mounting bays. Further pluses include the addition of a second rear outtake fan.

There are no fancy front plates or anything for the PC7x, the three variants available are brushed aluminium, brushed aluminium with a Perspex panel and plain black.

Cooler Master

Web Site: www.coolermaster.com
Distributor: Australia IT www.australiait.com.au
Supplier: Australia IT www.australiait.com.au

Known as a major player in the Heatsink market, Cooler Master has recently made a big impact in the case market with its ATCS (Active Thermal Convection System) series of cases. For us mere mortals this means that Cooler Master makes very nice all-aluminium cases.

The ATCS cases are works of industrial design art. Both functional and gorgeous, the major thing keeping Cooler Master from rivalling Lian Li in the market is that these cases are horrifically expensive, thanks to high quality design and the tyranny of freight costs.

The cases demonstrate some of the highest quality construction we have seen, with little touches like bracing and reinforcing used throughout the cases to add the solidity seen in steel cases to the lightweight nature of aluminium ones.

Like the Lian Li range, the ATCS cases use thumbscrews extensively and feature removable motherboard trays. In fact, a lot of the design philosophies behind these cases seem to flow from the successes of Lian Li.

Cooler Master hasn't stopped there. Each model features a different cooling design, and they all sport outlet fans directly at the top of the case and at the rear near the CPU. The aluminium used is of a thicker gauge than the competing cases, and this means that the edges are unlikely to cause a problem with cuts and scratches

There is an extensive range of Cooler Master cases out there, however we have looked at two of the cheaper models, The ATC101 personal system case and the ATC110 small server case.

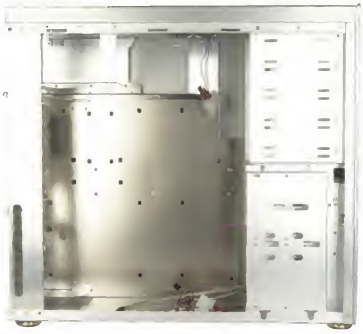
ATC101

Price: ATC101 $695 (No PSU)

Upon looking inside the ATC101 the first thing that strikes you is the front intake fan. This sits at the base of the drive bays and draws air from a generous vent below the case. The really funky thing is that the fan mounts on a swivel point, which allows you to adjust the direction of airflow into the case. The downside is that this ends up pinching a lot of potential drive bay space.

In fact, the ATC101 only has two internal 3.5in drive bays (and one external bay). This is partially made up by the inclusion of a generous five 5.25in bays, which means that there is enough room for extra 3.5in drives, but you will have to get some mounting racks for them.

The front of the case includes two USB ports, which run from the motherboard headers and are neatly tucked behind a spring-loaded cover.



ATC110

Price: ATC110 $795 (No PSU)

There are many similarities between the ATC101 and ATC110 cases, however they each sport totally different drive bay arrangements, front panels and intake fans. The ATC110 uses two front mounted intake fans, which sit in front of the 3.5in drive bays, providing extra drive cooling as well as keeping the case cool.

This design means that the ATC110 can handle a lot more 3.5in drives than the ATC101, with two external and four internal bays available. There are also five 5.25in drive bays, which are covered by a steel door, saving us from the hassle of painting the face plates of the drives, and keeping the front of the case looking uncluttered.

AL3

Web Site: www.dilithium.com.au
Distributor: Dilithium Computing www.dilithium.com.au (03) 9749 5366
Supplier: Dilithium Computing www.dilithium.com.au (03) 9749 5366
Price: $249 (No PSU)

As a new player in the aluminium case range, the AL3 from Dilithium is much cheaper than competing cases. Design wise, the AL3 lacks some of the major features of the more expensive cases, such as the removable motherboard tray and front intake fans.

One feature that is unique in this roundup is the use of clips for drive attachment. This means drives are easily removable, however this is something that most people will not have a huge amount of use for, as drives tend to stay in one place once they are installed.

Unfortunately, the AL3 is not as deep as the Lian Li, and this means the old problems with drives overhanging your motherboard comes into play. This is more an inconvenience than a flaw.

The AL3 doesn't offer the greatest cooling solution, with the one fan mounted on the back of the case near the CPU acting rather incongruously as an intake (this is easily fixed by turning the fan around to act as an outlet). There is a second mounting point on the side of the drive bays, however any fan mounted here will have problems getting any fresh air into the case.

That said, the case does provide a good solution considering the low price. The addition of two front mounted USB ports and one FireWire port is a handy feature, but the highly chromed plastic highlights used on the case front are perhaps a little too much.

It's Al good

Hats off to Humphrey Davy (1778-1829). Not only did he do extensive research into the 'pleasant sensations' caused by Nitrous Oxide, he also postulated the existence of another element, which he called 'alumium' – later to be renamed to 'aluminium'.

Since then, aluminium has gone on to become one of the most prevalent metals to be produced, and more is produced each year than all other ferrous metals put together. It is the third most abundant element in the Earth's crust, after oxygen and silicon, and is extracted from three main types of the compound Bauxite: Gibbsite, Böhmite and Diaspore.

Its atomic symbol is Al, it has an atomic number of 13, an atomic weight of 26.98154, an electron configuration of 2-8-3, and a tensile strength of 49 megapascals (MPa), although can raise to around 700MPa after heat and alloy treatment. It has a wide range of uses, both in its raw elemental form, as well as an alloy with other metals such as copper, magnesium, silicon and manganese. It is also a popular substitute for conventional stainless steel in computer cases.

It has a number of advantages over steel for use in cases, such as its lightness, strength, conductivity, and its cool appearance. It is one third the weight of steel, and while it is not as strong, it is sufficiently strong for use in cases since they don't bear much weight – it's not like you're holding up a bridge or anything. It is also the most conductive element by weight at one third the weight of copper and 61% as conductive. As such, it dissipates heat quickly and uniformly, thus helping to keep your case cool. It is also corrosion-resistant since it forms a natural barrier of aluminium oxide 0.000000635cm thick over its surface. The only down side is its cost relative to steel.

Skyhawk SK4336SL

Web Site: www.skyhawkusa.com
Distributor: Sky Hawks Electronics (02) 97906647
Supplier: Sky Hawks Electronics (02) 97906647
Price: $129

The brushed aluminium look may be the in thing, but that isn't the only way to finish an aluminium case. Skyhawk's SK4336SL comes with a polished finish and plastic faceplate. An ultra-low budget solution, the case design and construction reflects this.

The first thing that strikes is the use of a large fan duct that sits above the CPU and sucks hot air out of the case. Unfortunately, the duct and CPU fan end up pushing air away from each other. The case does feature a front intake fan, however this relies heavily upon a tiny gap at the bottom of the faceplate for cooling.

The main problem with working in the case is that it is so cramped. Without a removable motherboard tray, working on the motherboard involves removing the duct, and maybe shifting some drives to get full access to the board.

On the plus side, the case is cheap, and comes with a 300 watt P4 PSU. For a case modder after something different, or someone who wants a shiny silver PC on a budget, this is a very decent option.

Oh so pretty

There still aren't many aluminium cases out there, however we have come a long way from the early days when a Lian Li PC60 was the only available option. There are now cases sitting across the price range, and this is reflected in the quality.

The ATC101 and ATC110 cases from Cooler Master may be the most expensive that we have tested, however they are hands down the best cases we have worked with. In terms of looks and construction, they stand out from the crowd of both aluminium and non-aluminium cases. It is just unfortunate that they are so costly.

That said, Lian Li cases still stand out from the crowd. You can now get replacement sides with Perspex panels and front I/O ports that fit into a 5.25in drive bay. For those who can't afford the splurge needed for a Cooler Master, the range of Lian Li cases still show why they are so popular. They are still some of the easiest cases to work in, have high quality inbuilt cooling and now offer a variety of cosmetic options to make your Lian Li stand out from the next one.

The budget models are a great idea, however looks are such a small factor in the more expensive cases. What really counts is the quality of design, construction and ease of use, areas in which both the budget cases we have reviewed here are behind the Cooler Master and Lian Li range.

With these cases, it is a case of getting what you pay for. The more cash that you are prepared to fork out, the better the whole package becomes. Now that budget cases are appearing on the, it is only a matter of time before someone combines functionality with low cost, but for now it is a trade-off between economics and quality.

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Really fast graphics

Bennett Ring got his hands on 17 of the most powerful video cards available to humanity, and only fried one with his drool.

Buying a video card at the moment can be a slightly confusing prospect. Since the release of NVIDIA's Titanium series, it hasn't been clear how the three GeForce3 types now available differ from each other, other than a slight variation in clock speed and a huge difference in price. Throw in ATI's new Radeon 8500 with its performance quirks and choosing a video card seems about as simple as decoding the human genome using only an abacus and a magnifying glass.

If you think you've had enough confusion already, by the time you read this the GeForce4 should be hitting the streets, making your choice that little bit harder. The good news is that it should also lead to further reductions in the prices of the cards within this roundup, so you won't have to think about pawning your granny to afford one – instead she can just work nights.

To help you make a better choice when you upgrade, Atomic rounded up a selection of GeForce3, GeForce3 Ti 200, and GeForce3 Ti 500 cards, as well as the only two Radeon 8500s we could find. Our reviews will give you a clearer indication of what you can expect from each of these chipsets, and as a result, reinforce the notion that it's the chipset that matters, not the manufacturer. Did I just say that out loud?

So how do the GeForce3, GeForce3 Ti 200 and GeForce3 Ti 500 differ? Two words: clock speed and manufacturing process. The Titanium series cards are built using a refined manufacturing process, leading to a decrease in their cost. But the important difference is the speed at which the memory and core run. The following table makes the speeds variations clear:

	GeForce3 Ti 200	GeForce3	GeForce3 Ti 500	
Core:	175MHz	200MHz	240MHz	
Memory:	400MHz	460MHz	500MHz	

The Ti 500 looks like the Gonzales of the pack, especially in regards to the core speed with an increase of 25% over the standard GeForce3. Unfortunately the memory is where most bottlenecking occurs, and the Ti 500's memory speed increase of around 9% isn't that much greater than the standard GeForce3.

How we tested

We installed each video card into our new Athlon XP test bench, along with a clean install of Windows XP and the 21.83 Detonator drivers. We tried to use NVIDIA's latest 23.11 drivers, but encountered severe problems with several of the video cards when using this driver set. We used the 6.13.10.3286 drivers for the ATI Radeon 8500s. Four different benchmarks were used to benchmark the cards: the Quake 3: Arena Atomic demo, 3DMark2001, Serious Sam and Dronez. A variety of resolutions and graphics configurations were used for each benchmark. To our dismay the Radeon 8500, despite being a fully DirectX 8.1 compliant video card, would not utilise the vertex and pixel shader features within the Dronez benchmark, so we haven't published these results.

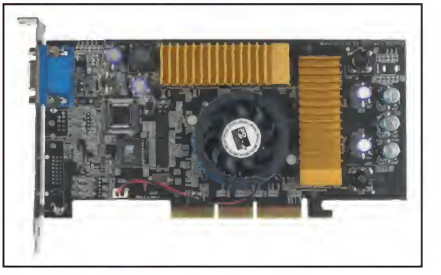
For the overclocking tests, we used NVMax to tweak the speed as well as 3DMark2001 in looping benchmark mode for an hour to test the stability of each speed.

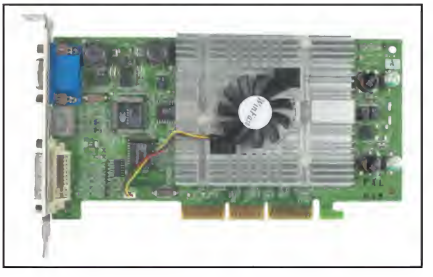
Absolute GeForce3 Ti 200

Price: $549 **Contact:** Innovision www.innovision.com.au 1300 785 795

Absolute is quickly building a reputation as a quality supplier of well priced products, and this video card is further proof. As far as video cards go, this product is definitely from the school of keeping it simple. There aren't any VIVO (video in/video out) capabilities, instead it ships with only a 15 pin D-sub connector for connection to a standard monitor.

There is nothing else included with this product apart from the video card and the standard useless driver CD – which is of course, out of date, which won't bother anyone with the net. This helps keep the price down to a value packed $549, which is quite remarkable considering the performance this card offers.



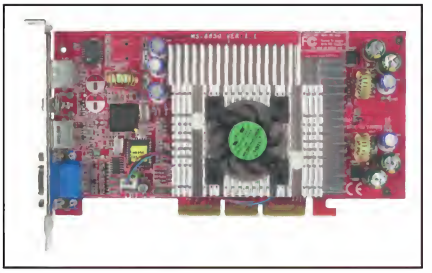


LEADTeK GeForce3 Ti 200

Price: $590 **Contact:** BCN Technology www.bcntech.com.au (02) 9648 0039

This video card benchmarked just like – surprise, surprise – the rest of the GeForce3 Ti 200s. It goes to show that the days of differing performance from video cards that use the same chipset are well and truly over.

Unlike the Absolute Ti 200, this card ships with the standard D-sub connector as well as composite out and DVI out. So if you've got a digital display device, this could be the budget GeForce3 card for you. On the other hand, if you've got a digital display device, you've probably already got a decent video card in the Silicon Graphics workstation that you use as an MP3 player.



MSI GeForce3 Ti 200 PRO-VTG

Price: $475 **Contact:** MSI Computer www.msicomputer.com.au (02) 9748 0070

This is easily the most feature rich of all of the Ti 200 packs included in the roundup. For starters, the included stereoscopic glasses should satisfy any urges for a quick migraine or bout of motion sickness. Alongside the D-sub output are S-Video in/out, as well as the more commonplace composite output. A DVI output is noticeably absent, but then again there aren't many users of digital displays.

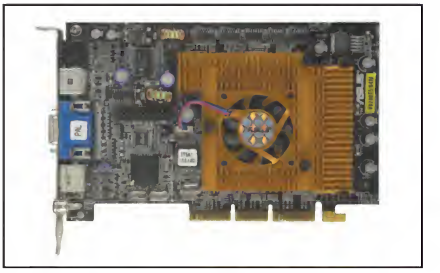
There are also a couple of decent applications included, such as the game Sacrifice and a software DVD decoder. The same card can be purchased without these extras for the meagre price of $400. (I'm sure

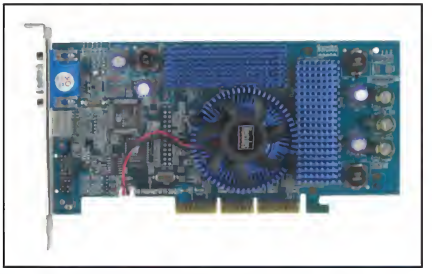
ASUS GeForce3 Ti 200 Pure

Price: $599 **Contact:** CASSA www.cassa.com.au (07) 5445 2992

Atomic is usually fairly pro ASUS, as it produces some of the best value and better performing components, so it's with much dismay that we have to say this video card is priced too highly for it to be competitive.

Considering the higher price of this video card, you'd be forgiven for expecting a few value adding extras in the pack. A standard D-sub output is all that is provided. Three dated games have been included: Sacrifice, Messiah and Star Trek New World – played in quick succession they're guaranteed to keep you bored for at least three minutes. You'd think ASUS would at least include a couple of games that would put the GeForce3 through its paces.





Hercules GeForce3 Ti 200

Price: $549 **Contact:** Guillemot http://au.hercules.com (02) 8303 1818

Just like every Hercules video card that has passed through Atomic's labs, this device is comprised of a funky blue PCB with blue heatsinks for both the GPU and the memory. And just like every Ti 200 card, it benchmarked the same as the rest of the pack. It's not the most expensive of the Ti 200 based cards, and the composite out will come in handy for those who like to game or watch PC DVDs from the couch.

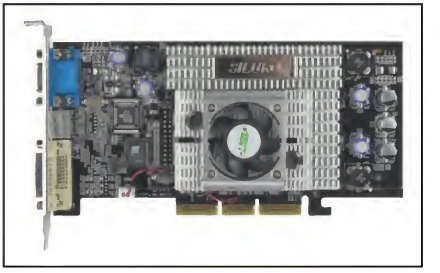
This card is also light on the stocking fillers, containing a driver CD and a copy of PowerDVD. If you ask us, this is a very good thing, as the majority of games and applications included with hardware these days are unworthy of insertion into your CD drive.

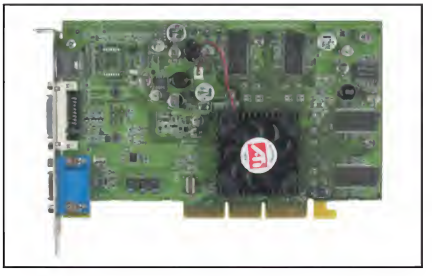
ABIT GeForce3 Ti 200

Price: $579 **Contact:** Synnex www.synnex.com.au (02) 8748 9800

Is this one of the sexiest looking cards in the roundup? Fruck yes! The black PCB combined with a behemoth of a heatsink makes this the perfect card for those with a perspex fetish. The video out and DVI out should satisfy the needs of those with multiple display devices, which explains the slightly higher price of this Ti 200.

Once again, this Ti 200 performed just like every other Ti 200, slightly slower than the GeForce3 and GeForce3 Ti 500, but with benchmark scores that are still incredibly fast. For those on a budget, any of the Ti 200 cards will deliver performance levels that were unheard of a year ago at this price point.



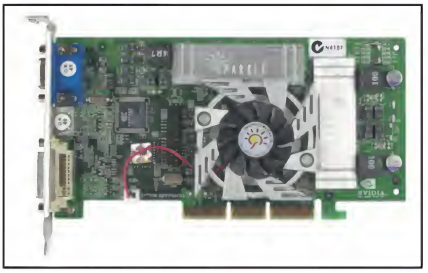


ATI Radeon 8500

Price: $839 **Contact:** Servex www.servex.com.au (02) 8745 8400

It appears the pixies of misinformation have been having a field day with the Radeon 8500. We had been led to believe that this video card would cost around the $600 mark, so you can imagine what we blew when we discovered it was more like $840. With the exception of the 3DMark2001 benchmarks, this card tested around the same level as the Ti 200 and it costs nearly twice as much. So why would you ever buy a Radeon 8500 at this price?

There is no debating the superior image quality and spectacular DVD playback capabilities that the Radeons deliver. If the price of this card drops, it could be a worthwhile purchase, but until then . . .



Powercolour Radeon 8500LE

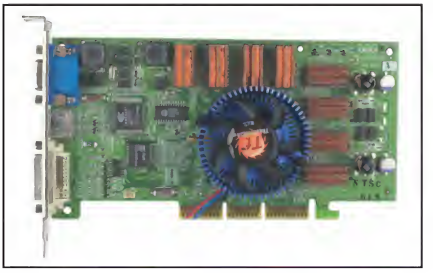
Price: $525 **Contact:** Australia IT www.australiait.com.au (03) 9882 1811
At around the same cost as a Ti 200, this 250MHz version of the Radeon 8500 (as opposed to the standard 8500 which runs both the memory and the core at 275MHz) is a steal for those who don't mind sacrificing a little performance in order to enjoy enhanced image quality, superior DVD playback and dual monitor support.

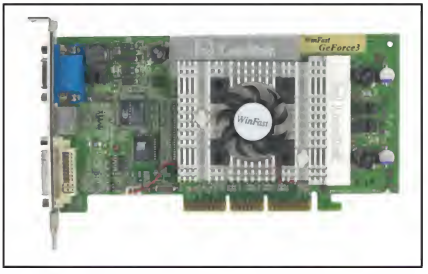
As the results show, the Radeon 8500 cards really strut their stuff in the Direct3D 3DMark2001 benchmark, giving even the mighty Ti 500 cards a good run for their money. The same cannot be said of their OpenGL performance, with some lacklustre results especially in Quake 3: Arena. We're still hoping that improved driver sets rectify this.

Titan 3 GeForce3

Price: $699 **Contact:** Overclockerz Supplies www.overclockerzsupplies.au.com
To be brutally honest, this video card looks dodgy. The Blue Orb heatsink/fan doesn't even have its own power source: it needs to be plugged into your motherboard or PSU before you can use it. The bizarre individual copper heatsinks on each RAM chip look incredibly cheap, but it appears they do the job extremely well. The card arrives already overclocked, with the core running at 215MHz while the memory is at a Ti 500 beating 515MHz.

This results in performance that is only slightly lower than the Ti 500 cards in the roundup. Considering the price of this video card, this has to be one of the best value top end video cards available.





LEADTeK Winfast GeForce3

Price: $850 **Contact:** BCN Technology www.bcntech.com.au (02) 9648 0039
While this card is advertised at $850, we've seen them floating around for approximately $200 less. Unfortunately for this card the 10% increase in performance over the Ti 200 doesn't seem to justify a price that is up to 50% higher.

Like the majority of the GeForce3 and GeForce Ti 500 video cards available, S-Video out and DVI out are included. Copies of Dronez, Gunlok and Leadtek's own DVD decoder also help to fill out the massively oversized packaging.

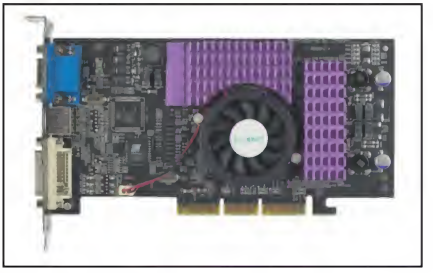
Unless the price of the GeForce3 cards start to drop, we can't really recommend them over a Ti 200, unless they overclock well.

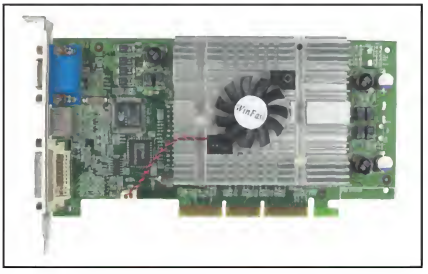
Absolute GeForce3 Ti 500

Price: $899 **Contact:** Innovision www.innovision.com.au 1300 785 795
Like most of the Ti 500 video cards available, the Absolute GeForce3 Ti 500 comes at a high cost, being a smidgeon under a thousand dollars. Unless you own a monitor capable of running at a high refresh rate at 1600 x 1200, you'd be much better off going for a Ti 200. At lower resolutions the Ti 200 and Ti 500 aren't far apart, but at 1600 x 1200 the Ti 500 can be up to 35% faster than the cheaper model.

Amazingly enough, this pack also ships with a decent game: Serious Sam. At last!

Along with the ABIT Ti 200, this Ti 500 is one of the better looking cards in the roundup.



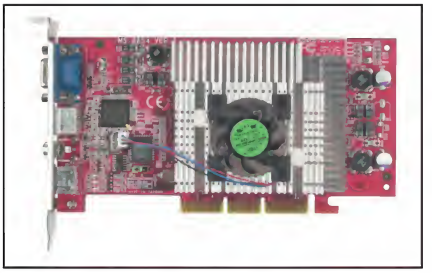


LEADTeK GeForce3 Ti 500

Price: $899 **Contact:** BCN Technology www.bcntech.com.au (02) 9648 0039
For a $900 video card, you'd expect it to be jam packed with goodies to tempt you into selling off another relative. If you could call a copy of Gunlok and Dronez goodies, then you won't be disappointed. For those of us with more than half a brain, it's pretty obvious that Leadtek might as well have not included anything.

As with all of the GeForce3 Ti 500s in the roundup, Leadtek's card includes TV out and DVI out as well as the standard D-sub out. As the benchmarks prove, this Ti 500 performs almost identically as the rest of the Ti 500s.

Which means it's bloody fast.



MSI GeForce3 Ti 500

Price: $720 **Contact:** MSI Computer www.msicomputer.com.au (02) 9748 0070

We don't know how MSI manages to price its GeForce3s substantially lower than the competition, yet still manage to pack more features into its products than anyone else. The cards even come in extra pretty boxes! w00t!

Just like the Ti 200 pack, this product ships with MSI's own stereoscopic glasses, but I can't think of anything nice to say about any brand's scrotic goggles. To service your display desires, a wide range of outputs are featured, including S-Video in/out, TV out and the usual D-sub out. If you've got a spare $720 and are in need of a new video card,

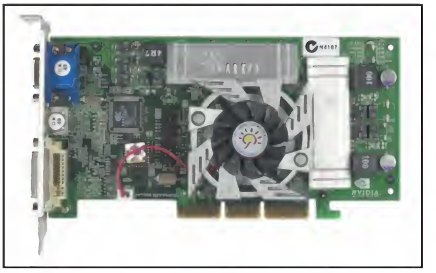
Sparkle GeForce3 Ti 500

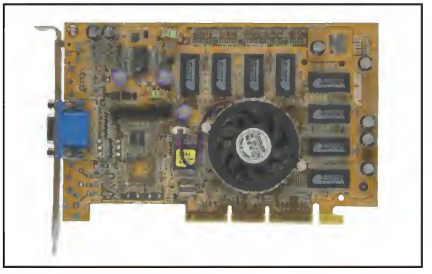
Price: $785 **Contact:** Australia IT www.australiait.com.au (03) 9882 1811

The heatsink for the GPU and RAM on this card definitely fall into the category of 'bizarro weird shit'.

The RAM sinks are significantly thinner than those found on every other card in the roundup, looking like metallic strips of gum, while the GPU heatsink looks more like a shuriken.

Despite the lower price of this product, it performed just as well as the rest of the GeForce3 Ti 500s. This is another product from the less is better school of thinking, with the only extra being a driver CD (useless). Unless you don't have access to a Net connection . . . in which case we all feel sorry for you.





ASUS GeForce3 Ti 500

Price: $899 **Contact:** CASSA www.cassa.com.au (07) 5445 2992

This is another of the GeForce3 packs to ship with stereoscopic glasses. Why?! The technology is still so ungainly that if I wanted to experience nausea and a ghosting of the image being presented I'd . . . do something very bad.

A variety of output options are present on this card, from S-Video in/out, to D-sub and finally composite out. Star Trek New Worlds, Sacrifice and Messiah are also included within the pack.

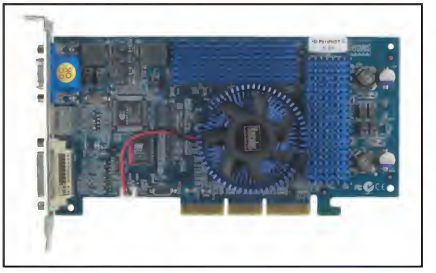
But once again, at $180 more expensive than the MSI card that includes exactly the same functions, only a price drop would cause us to recommend this over the MSI card.

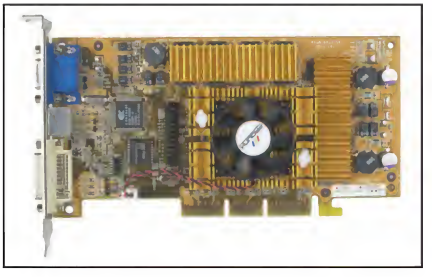
Hercules GeForce3 Ti 500

Price: $899 **Contact:** Guillemot http://au.hercules.com.au

At a couple of hundred dollars more than the cheapest GeForce3 Ti 500s in this roundup, it's surprising that this product doesn't come with any extras. A copy of PowerDVD looks rather lonely rattling around on its own in the large box.

As for performance, we're sure you've by now realised that none of the cards with the same chipsets perform radically differently to the rest of the bunch. So it all boils down to price and features, and sadly the Hercules GeForce3 Ti 500 just can't compete with the MSI Ti 500 in either of these areas. For that matter, not many of the cards can compete with the exceptional value of the MSI product.





Prolink Pixelview GeForce3 Ti 500

Price: $699 **Contact:** Checksun www.checksun.com.au (02) 9317 3155

As the cheapest GeForce3 Ti 500 in the roundup, it's reassuring to see that its performance levels haven't suffered from the budget price. In fact, it's retailing at the same price as the Overclockerz Supplies GeForce3 Titan 3.

Due to the extremely low price, this Ti 500 ships with no additional software or hardware. It's surprising that more of the manufacturers don't follow suit with this approach, as it could easily knock $100 or more off the cost price. If you really need a GeForce3 Ti 500, and don't want the extras offered by the MSI pack, this could well be the card that you want.

Overclocking

To test the overclockability of each chipset, we picked a random example of each type of card and then pushed it as far as it could go without onscreen corruption rearing its ugly head. In a perfect world we would have been given three examples of each card, before averaging the overclock gained from each model. Don't expect each and every card of the same chipset to overclock identically to the random sample we chose, but at least it will give you a ball park estimate of what each chipset is capable of.

Video Card	Default Speed	Overclocked Speed
ATI Radeon 8500	mem=275MHz core=275MHz	mem=285MHz core=285MHz
Absolute Ti 200	mem=400MHz core=175MHz	mem=450MHz core=200MHz
LEADTeK GeForce3	mem=460MHz core=200MHz	mem=500MHz core=220MHz
Hercules Ti 500	mem=500MHz core=240MHz	mem=560MHz core=250MHz

We're still waiting

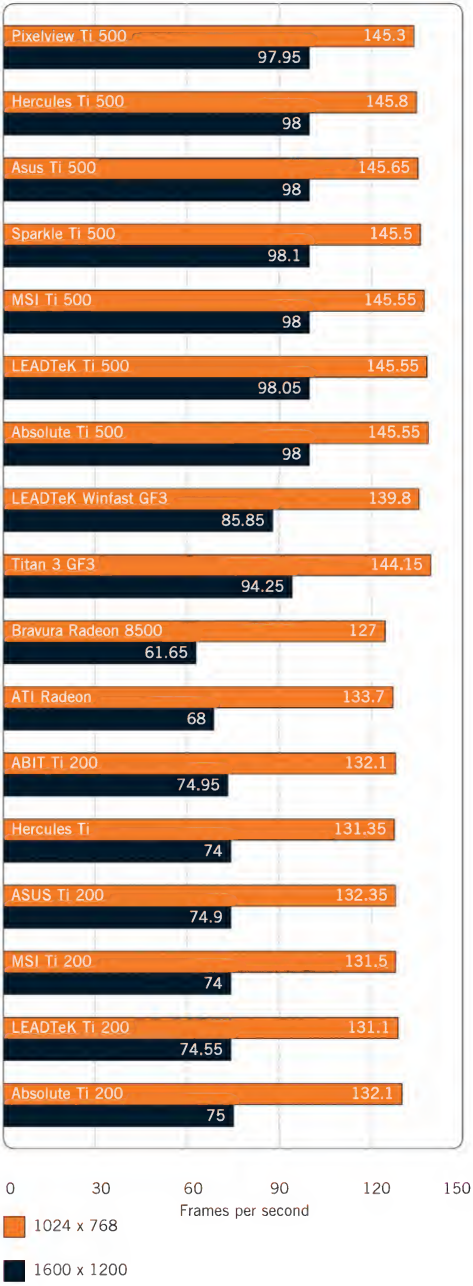
While the prices of the GeForce3 range and Radeon 8500s have tumbled over the last few months, there is still a barrier preventing the rapid uptake of this range of cards. Even though both the GeForce3 and Radeon 8500 are fully DirectX 8 compliant, there are only two games that spring to mind that actually use the advanced pixel and vertex shaders within these cards. Those games are Aquanox and Dronez, and boy do they look sweet because of it. This makes the DirectX 8 features of these cards for the most part useless, other than having the ability to run a handful of cool tech demos and being touted in misinformed marketing schemes.

It has been over a year since the first GeForce3 hit the PC, so what the hell is taking game developers so long to incorporate the spiffy graphical techniques that the feature sets of these cards make possible? It's the same problem that befell the GeForce2's Hardware Transform and Lighting acceleration when it was first released.

You have to look at it from the developer's point of view: why bother learning how to program and use the new features of these cards if only a tiny percentage of the people playing your games are going to have the hardware to make use of this?

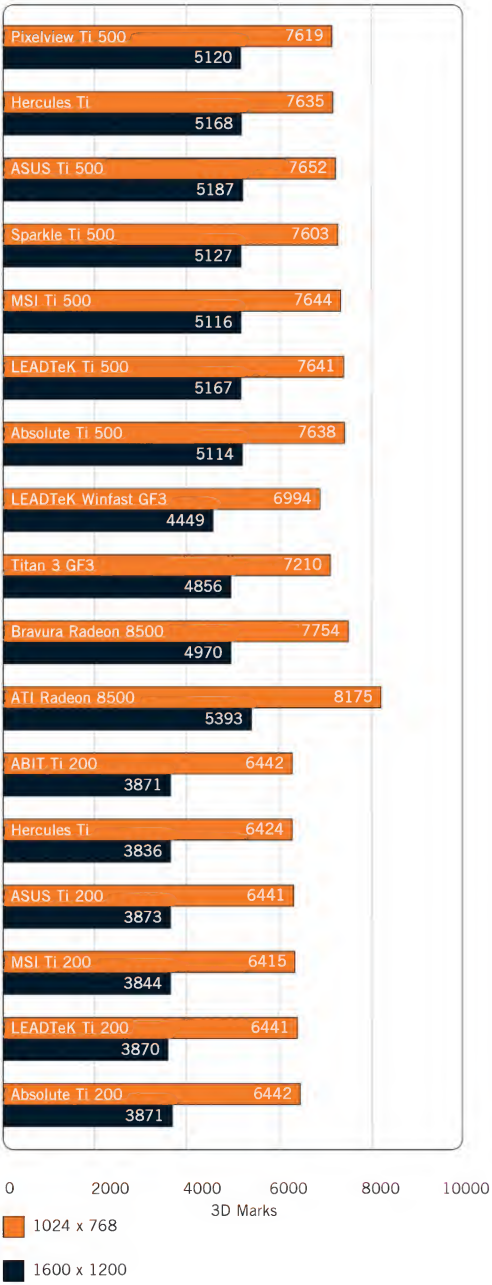
Even though the GeForce2 was released over two years ago, there are still only a handful of games that make use of its hardware T&L function. You'd think that by now the GeForce 2 would be in enough PCs for developers to start making use of this, but apparently not. Not to mention that the pixel and vertex shaders of the new DirectX 8 cards offer very powerful new features to developers. 'Powerful new features' usually equals 'difficult, new programming skills', which could also help to explain the slow uptake of these features. It's going to take a while for programmers to get their heads around the method of programming needed to use these features, but once it does happen you can expect a glut of new games that take advantage of them.

Quake 3: Arena



For the purposes of this roundup, we maxed all of the graphics options within Q3

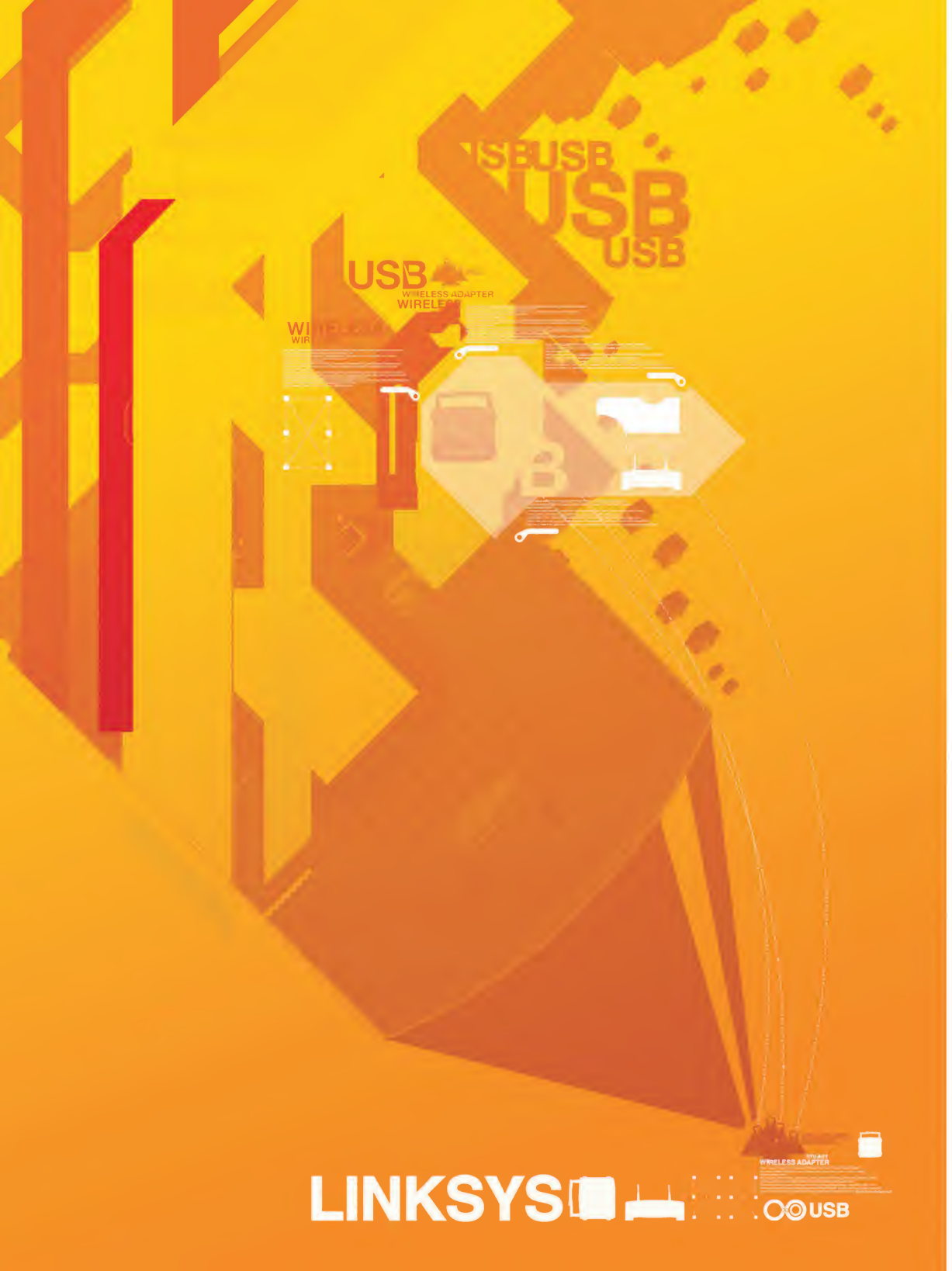
3DMark2001



The default settings were used when benchmarking with MadOnion's 3DMark2001

Serious Sam

When testing with Serious Sam, 32-bit colour and quality graphics option were selected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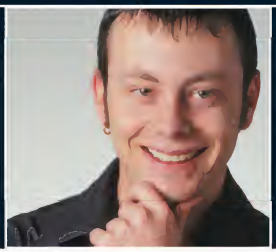
The End is Nigh

The PC's days as a gaming platform are numbered, thanks to the Xbox. And Big Bird is going to be the next president of America.



Here we go again. The PC as a gaming platform is going to die, and it's all because of the Xbox. Well, according to a few select PC bashers anyway. Sounds familiar? Think back to the launch of the SNES, the Megadrive, the N64, the Dreamcast, the PS1 and more recently the PS2 – every one of these console releases has been accompanied by premonitions from people who think that they're a modern day IT Nostradamus.

I'm ashamed to admit it, but for a short period I was once one of those deluded losers. When Goldeneye was released for the Nintendo 64, my humble PII-266 suddenly looked rather archaic. With my birthday rapidly approaching, a Nintendo 64 promptly appeared at the top of my PRL (present request list). Due to the generosity of my beloved other half, I was soon blasting away buddies on my shiny new N64, and all you could hear sprouting from my mouth for the next few weeks were the blasphemous words 'Bah, who needs a $3,000 PC when you can play even better games on a $300 console?'

Thank God this temporary insanity didn't last long. Shortly after receiving the N64, a friend at work decided he just had to show me Quake 2 running on his expensive new Voodoo 2. Bastard. All of a sudden Goldeneye began to look like the pixelated, low-resolution console game that it was. On that day I learnt the lesson that the PC will never die. Sure, it may metamorphose into a machine that bakes your meals, refrigerates your food and monitors your home security, but it will still be the hardcore gamer's machine of choice.

The one thing the PC will always have over the consoles is its ability to be upgraded. Once you've bought a console, you can be sure that the hardware within is going to remain unchanged, although the occasional external hard drive or modem release might fool you into thinking otherwise. While the hardware within a console might have what it takes to give the PC a good run for its money when the console is first released, you can be sure that within a couple of months the PC will have evolved into an even more powerful creature. Within a year of the console's release, the PC will make the console look like nothing more than an overclocked Etch-A-Sketch.

The same will happen with the Xbox. At the moment, its GeForce3 and Intel CPU combo will have many PC gamers scratching their noggins, wondering why on Earth they're sticking with the pricey PC to get their gaming fix. In fact, that very same thought sprung into my head after my first bout of Halo. Thankfully I had learnt my lesson in the past, so I didn't let this thought rebound around the innards of my cranium for very long. Due to the delayed release of the Xbox within Australia, it looks like the PC's next leap ahead will arrive even before the console, in the form of NVIDIA's GeForce4. So don't believe any of the hype, the PC will remain the ultimate choice for gamers for a long while yet.

Did you know the Xbox has an Ethernet adaptor for use with broadband connections? Which makes a nice segue way to a totally unrelated topic – Telstra's announcement of new prices for its broadband services. If you thought Australia's broadband situation couldn't become any poorer value for money, think again. Both residential cable and ADSL users have been slugged with a price hike, mere months after Telstra introduced a 3GB download cap. This has been offset by price drops for business accounts, but considering how highly priced these were to begin with it's not exactly big news. Cable users can look forward to uncapped download speeds with which they can chew through their measly 3GB of downloads faster than ever before, while the poor old ADSL users will still be limited to their capped speeds.

To make matters worse, Telstra apparently won't be refunding the installation costs of users who decide to cancel their contracts, although it will allow customers to leave the contract without the usual penalty fees. The icing on the cake has to be the new clause Telstra has added to its contract terms:

'7.4 You agree that usage reports will not be made available detailing your actual usage.'

This in effect means Telstra's usage meter can tell you you're under the 3GB cap, but in reality you might have exceeded it, in which case Telstra will bill you for the excess usage that you couldn't have been aware of. What ever will those friendly people at Telstra think of next?

Atomic benchmarks

Take a look inside the Atomic Labs testing procedures.

Here at Atomic it is our primary intention to give you the final word on the latest in hardware and PC technology. An integral part of determining the performance of a particular piece of hardware is benchmarking, and this is something we take very seriously in the Atomic Labs.

SYSmark2001

SYSmark is a product of the collaboration between industry group BAPCo (www.bapco.com) and MadOnion.com (www.madonion.com). It is the first of the next-generation application benchmarks and is designed to more accurately replicate the day-to-day workload that a system is subjected to. The benchmark focuses on Internet Content Creation and Office Productivity tasks in order to generate a final rating.

SiSoftware Sandra 2002 Professional

Sandra, from SiSoftware (www.sisoftware.co.uk), is a comprehensive benchmark and diagnostics utility. It contains dozens of special module applets that retrieve detailed information about the specifications and settings of a system, by polling each component's built-in firmware or BIOS. Sandra also features a small suite of synthetic benchmarks for specific components such as CPU, memory, CD-ROM and hard disk. It also features a burn-in wizard for stress-testing overclocked systems.

3DMark2000 Pro

3DMark2000 Pro from MadOnion.com is a powerful benchmark for testing Direct3D performance, and is the successor to the popular 3DMark99 MAX. Although it is a synthetic benchmark, it uses the advanced MAX-FX 3D engine from Max Payne, which is representative of the latest in Direct3D performance and technology.

3DMark2001 Pro

3DMark2001 Pro from MadOnion.com is the next progression of the popular benchmark utility. It also uses the MAX-FX engine and heavily emphasises DirectX 8.0 functions, including programmable shaders. The results are not comparable with results from 3DMark2000 Pro.

HSF testing

To test HSFs, we use our Athlon XP test bed, which uses an internal temperature diode. SiSoft Sandra 2002 is run in looping burn in mode, with both CPU tests selected for 30 minutes before the load temperature is recorded. The CPU is then left to idle for 30 minutes before the idle temperature is taken.

Quake 3: Arena AtomicMPC Demo

Quake 3: Arena (Q3A), from id Software, is the very popular first person shooter representing the latest in OpenGL gaming technology. Q3A has a built-in benchmarking utility and built-in demos that can test graphics card performance. These demos are fairly simplistic, and are not representative of the worst conditions that the game can offer to a graphics card. So we developed our own AtomicMPC Demo that pushes the hardware as far as possible.

Other benchmarks

Sometimes we need to break down the tests into more specific areas, such as hard disk performance, or a particular facet of 3D like T&L or SSE. For these specific purposes we can draw on a vast number of applications, games and dedicated benchmarks such as CD Speed 99, DisplayMate, Dronez, MDK2, Adaptec ThreadMark, or Serious Sam. Whenever we use one of these special benchmarks we will outline the nature of the tests, the testing procedures and any settings we use.

Atomic testbench specs

Both systems are running Windows XP Professional with DirectX 8.0a, as well as the latest official NVIDIA drivers.

- **AMD Athlon XP 1800+ system – ASUS A7V266-E motherboard (supplied by CASSA, www.cassa.com.au)**
- **Intel Pentium 4 2GHz – Abit TH7 RAID motherboard (supplied by Abit, www.abit.com.au)**

Common components

- **Samsung 256MB PC2100 DDR-RAM (supplied by CASSA)**
- **Samsung 256MB PC800 RD-RAM (supplied by CASSA)**
- **Hercules Prophet II GTS 32MB (supplied by Guillemot, http://au.hercules.com)**
- **20GB Ultra DMA/100 7,200rpm hard disk drive**
- **Hercules Prophet II GTS 32MB (Supplied by Guillemot, www.hercules.com)**
- **Sound Blaster Live! Player (Supplied by Creative Labs Australia, www.creaf.com)**
- **ASUS 52X CD-ROM (supplied by CASSA)**
- **Belkin PCI Firewire card (supplied by Belkin, www.belkin.com.au)**
- **Belkin PCI USB 2.0 card (supplied by Belkin)**

Benchmark settings

3DMark2000 Pro

- **1,024 x 768, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer**
- **1,024 x 768, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer**
- **1,600 x 1,200, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer**
- **1,600 x 1,200, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer**

Quake 3: Arena AtomicMPC Demo

All tests use Quake 3 1.27g

- **CPU: 320 x 240, maximum geometry detail, minimum graphics settings, high sound quality**
- **Graphics cards: 640 x 480, normal quality graphics settings, high sound quality**
- **1,024 x 768, maximum graphics settings, high sound quality**
- **1,600 x 1,200, maximum graphics settings, high sound quality**

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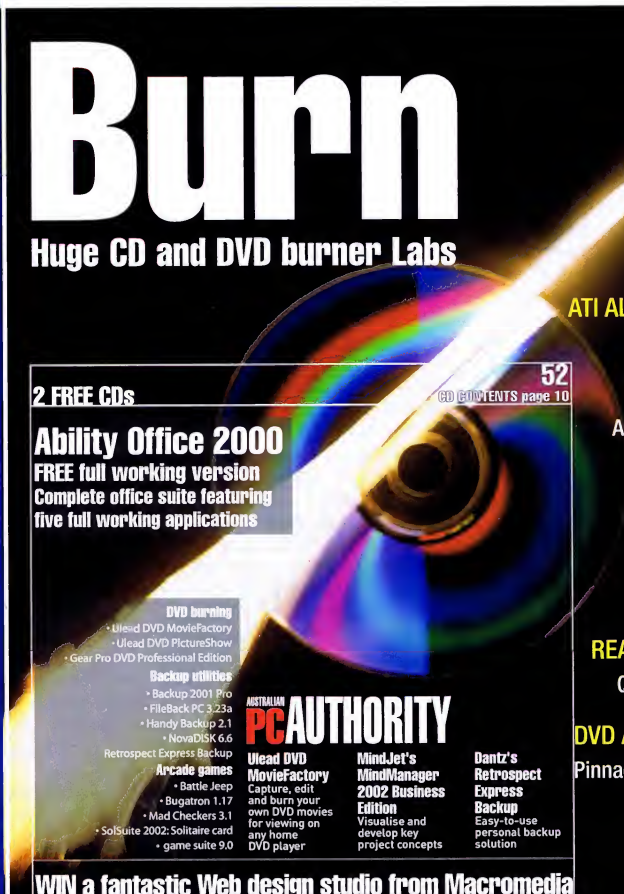

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Logitech Z-560 speaker

Logi's computer speaker set has shaken up the opposition. And Dan Rutter's light fittings.

Logitech's Z-560 system has four solid satellite speakers and a pretty control box, but what catches your attention is the big fat subwoofer. The Z-560 sub's wooden box isn't huge – 280 x 280 x 330mm in size, plus a bit for the feet and the array of cooling fins that covers most of the back. It's a lot heavier than the average powered computer subwoofer, though, and that's because it uses a genuine eight inch bass driver. This is a bass reflex enclosure; on one side of the sub there's a large flared port, which curves around cunningly inside the box.

The Z-560 satellite speakers are larger and heavier than average. They each have a single three inch driver with a fixed aluminium 'phase plug' in the middle, whose acoustic effect is debatable, but which sure looks cool if you unclip the cloth-covered grilles.

The satellites sit on aluminium stands which you can detach using a provided Allen key and rotate 180 degrees. This lets you easily wall-mount the speakers: you can just hang them from two screws, or bolt them on more solidly if you like.

The box of knobs that controls the Z-560 is grandly called the 'SoundTouch Control Center'. It connects to the subwoofer with a single fat two metre cable, and to four-channel input with two thinner 1/8th inch stereo-plug cables. The Control Center has power and volume and bass knobs, a 'fade' knob that acts as a volume control for the rear speakers only, a 1/8th inch headphone socket that mutes the speakers if you plug something into it, and an 'M3D' button that takes the front plain-stereo input and extrapolates surround data for the back speakers from it. M3D doesn't sound amazing, but it sounds good, and it's worth using for most non-surround input.

The M3D button lights up green. The volume control lights up blue. We find this acceptable.

Logitech claims a '400 watt RMS' power specification for the Z-560, but a quick look inside the speaker boxes reveals that the power rating stickers on the drivers only sum to 160 watts. That's 15 watts per satellite – not at all bad for small magnetically shielded drivers – and a hefty 100 watts for the sub driver, which has a large enough magnet that it's probably got decent efficiency, too.

Similarly, the 'THX Certification' of the Z-560 system doesn't mean it can deliver the imposing performance of THX certified home and theatre audio equipment. The Z-560 instead meets the much less stringent 'THX multimedia speaker specification', the exact details of which are hard to pin down. It's marketing blather, essentially. Never mind that, though. In listening tests, the Logitech system sounds pretty sweet. Provided you like bass, and lots of it.

The four satellites are noticeably smoother across their mid-to-high frequency range than the single-driver sats that come with most cheaper computer speaker systems. They don't have amazing high-end response, but they're more than adequate. They're fighting a losing battle against the sub, though. The Z-560 sub is, by computer standards, an absolute monster.

For most program material, we found that the Control Center's bass knob lets you adjust the bass from 'a bit too much' to 'far, far, far too much'. For light classical music and other fare with little bass in the first place, the Z-560 sub doesn't honk or sing particularly; it makes more midrange noise than is ideal, but it's far better than many computer subs. For most music, the bass is intrusively loud, even at the minimum setting; you have to turn the sub to minimum and then turn the bass down at the source if you want fairly flat response. But if you usually find yourself turning the bass up – well, this is the subwoofer for you.

For action movies and games, too much bass is seldom enough, and this sub makes up in enthusiasm what it lacks in accuracy. It's not high fidelity, but it beats the pants, the underpants, and most of the gluteal muscle off the usual kind of computer subwoofer.

For the money, the Z-560 is excellent value, especially if you judge the quality of a speaker system by how much dust it shakes out of your light fittings. O

SPECIFICATIONS

4.1 channel speaker system with eight-inch-driver ported subwoofer, and four satellites with one three inch driver each
Web site: www.logitech.com
Supplier: Logitech www.logitech.com
Phone: Logitech (02) 9972 3711 **Price:** $499

atomic 8/10

Belkin n30 Game Mouse

Compared to the organic lines of most modern mice, which bear a striking resemblance to Alien egg pods, the n30 is a very angular looking affair. To the left side is a large 'Battle Wing', which protrudes above the rest of the mouse and is supposed to stop you accidentally hitting the thumb button. At the base of the mouse is a plastic bumper which apparently aids accuracy and stability, but looks as if it would only ever be used if you played dodgem mice with a couple of friends.

In this day and age of optical mice it's surprising to come across a new mouse which uses the old ball design. This is necessary as the n30 is one of those products that likes to buzz a lot to make you feel happy. No, not one of *those* products you deviant, we're actually referring to force feedback here. Whenever you roll over an icon, button or hyperlink while at your desktop, the resistance to the ball is increased, resulting in a noticeable bumping effect. This also occurs within games when you shoot or an explosion occurs. It's amusing for a total of seven minutes before you stop noticing it. The force feedback action provides a nice little touch, but sometimes it's triggered when it shouldn't be, such as when you're reloading your weapon.

Considering the fact that this is a ball mouse, it's surprisingly accurate. Going from a dual optical mouse to this thing didn't equate to a noticeable drop in accuracy. The buttons have a solid click to them, while the scroll wheel also has a chunky feel.

If there is one problem with this mouse, it's the squareness of the thing. After a couple of hours it becomes clear that the other mice on the market are ergonomically sculptured for a reason; the n30 just doesn't feel comfortable. You might want to try it out for yourself, as comfort is a fairly personal benchmark, but the majority of the staff at Atomic agreed that the n30 isn't the comfiest mouse that had ever nestled within their hands. If only this thing was designed with the human hand in mind, instead of the claws of #5 from Short Circuit, this

SPECIFICATIONS

3 button, scroll wheel, immersion desktop, ball mouse, USB connection with PS2 adaptor

Web site: Belkin www.belkin.com.au
Supplier: Belkin www.belkin.com.au
Phone: Belkin (02) 4325 4666 **Price:** $80

atomic 7/10

Dynatron DC1206BM-0638 HSF

Ever since we got our hands on our new Athlon XP testbench, with its accurate internal temperature diode and a motherboard that makes use of it, we've had some rather shocking results when it comes to measuring CPU temperatures. Check last month's thermal paste review for a prime example. Well, it's happened again. This HSF has received some glowing reviews on the Net, admittedly by sites using a less accurate testing methodology than ours, but our results told a different story.

After testing the unit using our standard HSF testing procedure, and comparing it against a GlobalWIN FOP-38, the Dynatron consistently returned temperatures 1ÞC higher than the FOP-38, with a temperature of 37ÞC under load and a temperature of 34ÞC at idle (ambient room temperature was 22ÞC). Fearing we'd been given a dud, we sourced a replacement HSF, which provided identical results. So we reinstalled it, tested it again, and got identical results. In fact, we ended up reinstalling this HSF three times, and every time the results were the same.

This is nothing short of astounding, as the Dynatron is made entirely from copper and had one of the flattest bases we've seen on a HSF. Its quality of construction simply can't be faulted. It also has one of the loudest fans to ever make the Atomic crew's ear drums implode. So why on Earth doesn't it perform any better than an ageing, all aluminium HSF? You tell us and we'll all know.

Considering its rather steep asking price of $78 and its incredibly noisy operating levels, we simply can't recommend this HSF. We're not sure exactly why this unit gave us such mediocre performance, all we know is that it did.

SPECIFICATIONS

7,000RPM fan @ 44CFM, all copper construction, weight: 460 grams

Web site: Dynatron Corp www.dynatron-corp.com
Supplier: PC Case Gear www.pccasegear.com
Phone: PC Case Gear (03) 9572 3444 **Price:** $78

atomic 6/10

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The Digital Web Book format presents several opportunities, none more important then the incredible pass on ratio of each brochure/publication.

Digital Web Books are extremely small in file size, they present a familiar navigation system and can be used to attract new members.

Why are people attracted to Digital Web Books?

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Possible Uses

Catalogues - Flyers - Brochures - Annual Reports - Photo Albums - Newsletters - Media Kits - Work Portfolios - Corporate Presentations - Manuals - Books - Magazines - Novels Newspapers - Sales Presentations - Marketing Collateral - Intranet Publications - Restaurant Menus - Educational Materials - Reference Materials - Email promotions - Corporate / Product Profiles - Guides - Reports - Briefs - Directories - and much, much more!

DeskTopAuthor Features

- Produce digital brochures/newsletters with turning pages.
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- WSIWYG page creation and editing.
- Hotlink to pages, web sites, email and even other files.
- Digital Web Book file sizes are small, easily distributed by email, download or on floppy/CD.
- No browser required, no downloading of software or plug-ins. Pages fit your desktop screen, no scrolling required.
- Specify one of 6 page transitions - 3 x 3D fly Page Turns to choose from, basic turn, wipe and slide.
- Printable pages.
- Copy and Paste images from web sites into the DeskTopAuthor Image manipulation tool for easy cropping, downsizing and optimizing of images.
- Transparency feature.
- Suitable for all Windows-based PC's.
- Non-Mac compatible.

Benefits

- Fast to learn and easy to use, the DeskTopAuthor interface is designed with the average PC user in mind.
- Saves printing and distribution costs associated with print media.
- No scrolling as view each page within PC screen, turns pages like a real Book.
- Easy to distribute - via the Web, email, floppy or CD-ROM.
- Outstanding tool for marketing as it can be passed on easily by email.
- Recipients of the Book can store, view, interact with its content off-line.
- Drives traffic to your web site.
- Encourages customer loyalty, repeat purchases.
- Ideal custom publishing solution.

System and Software Requirements

Windows 95, 98, ME, NT 4.0, 2000, XP
Hardware Requirements (minimum recommended)
Intel® Celeron 300 MHz
64 MB RAM
8 MB Video Graphics Adapter
20 MB free disk space
Internet connection for product registration

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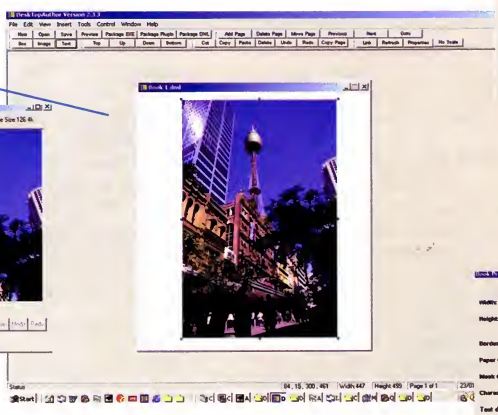
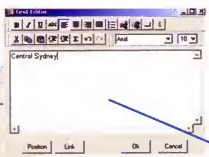
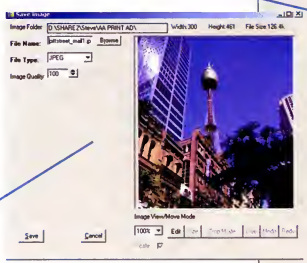
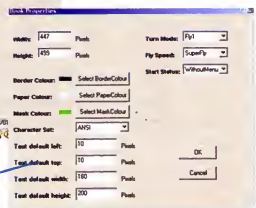




The Text Editor allows you to add + manuipulate text



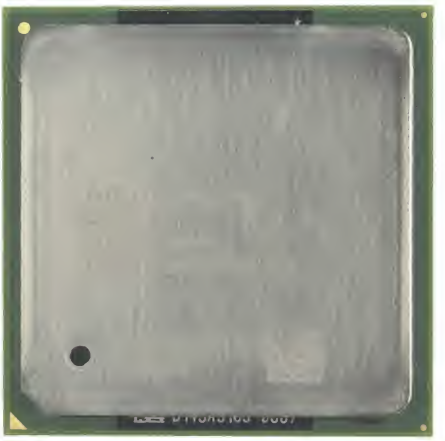
Optimise your images with the built-in Image Editor

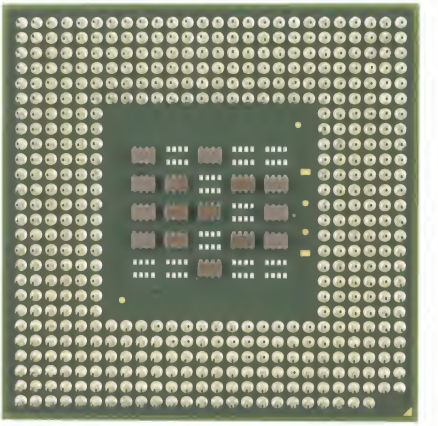


Personalize your WebBook settings in the Properties Dialogue Box

2GHz Northwood Pentium 4

Does smaller mean better? Intel thinks so but what about John Gillooly?





Welcome to the future of the Pentium 4. The movement of the P4 to a 0.13micron process has been a long time coming, and has been expected to mark the return of Intel as the king of desktop processor performance. The original Williamette-cored P4s have struggled to keep up with AMD's Athlon CPU line for the past year or so, and this has shown no sign of letting up as AMD keeps managing to squeeze more and more performance out of its venerable line of processors, whilst keeping its pricing way below that of Intel's, especially at the high end.

Intel's solution has been to drop the die size and up the L2 cache of the Pentium 4. A die shrink is beneficial because it allows for cheaper processors. As the amount of silicon needed per Northwood CPU is almost half that needed per Williamette CPU, simple logic means that Intel can squeeze twice as many CPUs onto each silicon wafer. The smaller process also gives headroom for the Pentium 4 to hit much higher clock speeds than in its previous incarnation.

The doubling of the L2 cache from 256KB to 512KB should theoretically up the processor performance by about 10% on a clock for clock basis. The inclusion of this extra cache means that the transistor count on the Pentium 4 is now 55 million, up from the Williamette's 42 million transistors (but still behind the GeForce3 GPU's 57 million).

The Northwood launched at 2GHz and 2.2GHz speeds, in 478-pin packaging only. To avoid confusion with the Williamette 2GHz P4s, the 2GHz Northwood will be known as the Pentium 4 2A, while post 2GHz processors will use the Northwood core.

AMD retaliated by releasing the Athlon XP 2000+ (1.666GHz) at almost the exact time Intel launched the Northwood. By rights, the new P4 core should give the lower clocked Athlon XP a run for its money. We tested the Northwood 2AGHz P4 against the Williamette 2GHz P4 and the Athlon XP 2000+. The P4s were tested using a Gigabyte GA-8IRXP i845-DDR based motherboard, with 256MB of PC2100 DDR RAM, and the Athlon XP was tested using an ASUS A7V266-E motherboard with the same RAM. All tests used Windows XP Professional with the latest drivers and updates.

We tested using SYSmark2001, Quake 3: Arena and SPECviewperf. For some bizarre reason (probably related to Intel being part of the industry consortium BAPCo), SYSmark2001 is seen as being very P4 friendly, due to its support of SSE. To even the playing field we used an unofficial patch from AMD that adds support for the Athlon XP implementation of SSE in Windows Media Encoder. The end result was that the Athlon scraped ahead of the Northwood P4 (and way ahead of the Williamette cored one).

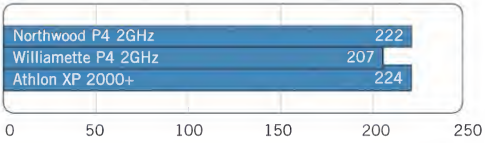
In Quake 3: Arena our CPU benchmark showed the Northwood snatching the lead. Again the margin was slight between the Northwood and the Athlon XP, with the Williamette slipping way behind the other processors. In SPECviewperf, which is more memory intensive than CPU heavy, the gaps were slight, with the Northwood and Athlon XP on par with each other, and ahead of the Williamette.

It had to happen. When Intel took a big step, bit the bullet and moved to the NetBurst architecture that drives the P4 there were always going to be problems. A new architecture has to be scaleable, and the P4 has all the requisites to improve with age. The drop to 0.13 micron and the addition of the extra cache that mark the Northwood core has done a lot to get Intel back on par with its rival AMD. The Pentium 4 and the Athlon XP are now at equitable performance levels, and the processor war is back into full swing. All Intel needs to do is halve its prices and we all win.

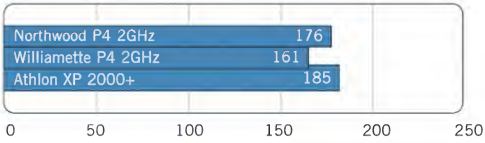
SPECIFICATIONS

478-pin CPU, NetBurst microarchitecture, 0.13micron process, 8KB L1 data cache, 512KB L2 cache.
Web site: Intel www.intel.com
Supplier: Intel www.intel.com
Phone: N/A **Price:** $900

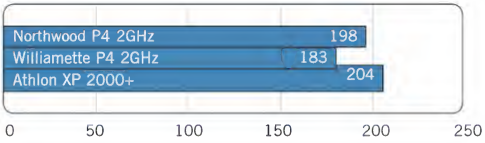
SYSmark2001 - Internet Content Creation



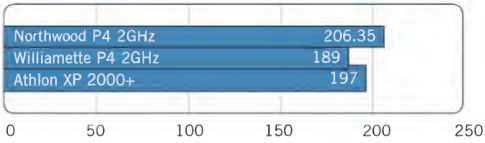
SYSmark2001 - Office Productivity



SYSmark2001 - SYSmark rating



Quake 3: Arena CPU settings



Altec Lansing speaker systems

Hands up, style victims. All you people may find yourself wanting one of these, spaketh Dan Rutter.

Altec Lansing's $399 4100 system and $249 2100 system are, respectively, 4.1 and 2.1 channel multimedia speaker setups with several things in common. They both use the same natty looking satellite speakers, for a start – the 4100 just comes with two more of them than the 2100.

The satellites are about 185mm tall, but only about 55mm wide and a scant 30mm or so deep, not counting the somewhat larger bottom of the cast-aluminium frames that hold the slim twin-driver enclosures. The two 'micro drivers' in each sat are only one inch units, but they've got a proper roll surround around their shiny concave aluminium 'cones', which gives them enough extension for some midrange as well as treble response.

On the plus side, these peculiar satellites look great, if black and silver suits your décor. Very small footprint, tall and skinny, easy to fit anywhere. On the minus side, they fall over backwards with only a very slight push (or tug on their cable), and they need a subwoofer that can handle quite high bass. One inch satellite drivers aren't going to make any contribution to even the upper bass register and the response from these sats fades away to nothing much around the 170Hz mark – which is a lot better than the one inch driver in the average telephone can manage, but it's still not exciting.

The Altec Lansing rigs also share the same sort of subwoofer. It's an upright design, about 320mm deep by 215mm wide by 355mm high, and it's got two forward-firing 5.25 inch bass drivers and one rear-facing port. The sub isn't magnetically shielded, so you shouldn't put it right next to your monitor, but subs should be on the floor anyway. The sub contains all of the power electronics.

Both systems are controlled with a stylish wired remote, which can be hand-held or hooked into a cast aluminium desk stand. The 2100 remote just has a power button and two more buttons for volume control: that's it. The 4100 control is fancier, with one knob for volume, bass and treble adjustment, depending on what button you press. Another button on the 4100 controller lets you select 'Gaming' mode, which is normal 4.1 output and requires both of the 1/8th inch stereo plug cables to be connected to something, or 'Stereo X2' mode, which just doubles the front stereo input for the rear satellites.

The 2100 system has no headphone socket, but the 4100 has one, on the top of the remote, and mutes the speakers when it's in use. The 4100 also has an auxiliary input, but it can't be individually selected – it just mixes over the front stereo pair. These aren't super-loud speaker systems, but they'll do for a computer room, and they considerably exceed the volume level that's likely to be politically acceptable at the office. The satellites do a surprisingly good job, considering their minuscule transducers, but you can't get away from the fact that the sub's two drivers have to fill in a significant amount of midrange. This means it's hard to avoid hearing where the sub is. True subwoofers are meant to output nothing but low bass, which is nondirectional; most computer subs output enough high bass and midrange that you can hear where they are.

Apart from that, the Altec Lansing sub does surprisingly well for something with a couple of un-amazing drivers in it. It doesn't buzz or honk when you wind it right up, and it provides more kick than you might expect for bassy music, games and movies. Altec Lansing claims 30Hz response from the sub, which is as much of a joke as most small subwoofer specifications. But we've heard plenty of five to six inch driver subs that don't do as well as this one.

The 4100 system costs only a hundred bucks less than Logitech's Z-560, also reviewed this issue, but the Logitech rig gives you more than a hundred dollars worth of extra bass. If a 2.1 speaker system's all you want, though, the 2100's quite affordable, does a respectable job, and looks terrific.

▲ SPECIFICATIONS: 4100

4.1 channel (4100) and 2.1 channel (2100) speaker systems with super-slim satellites and twin-driver subwoofers
Web site: www.altec-lansing.com
Supplier: Innovision www.innovision.com.au
Phone: Innovision 1300 785 795 **Price:** $399

atomic 6/10

▲ SPECIFICATIONS: 2100

4.1 channel (4100) and 2.1 channel (2100) speaker systems with super-slim satellites and twin-driver subwoofers
Web site: www.altec-lansing.com
Supplier: Innovision www.innovision.com.au
Phone: Innovision 1300 785 795 **Price:** $249

atomic 7/10

Creative Inspire 5.1 Digital 5700

Dan Rutter is disappointed with his two-inch driver, but at least he's got four of them.

Creative's flagship multimedia speaker system has a hefty $899 list price, but for your money you get a full 5.1 channel setup – left and right front, left and right surround, centre and subwoofer. It's all tied together by a control unit with lots of lights and buttons, none of which are just there for show.

This system has two plain 1/8th inch stereo input leads, for boring four channel analog input. But it can also accept Creative's 'Digital DIN' input, and cables are included if you've got a Sound Blaster card that supports it. If you've got gear with more standard digital output, no problem; electrical (RCA) and optical (TOSLINK) S/PDIF inputs and cables are also provided. You can connect sources to all of the inputs simultaneously, and switch between them at will.

If you're using a digital input, the 5700 will automatically detect and decode Dolby Digital, DTS, and even good old Dolby Pro Logic surround data from your DVD player or PC. You can turn on Pro Logic surround decoding manually for stereo analog input, too. Bingo, surround from your plain stereo VCR as well.

There are also two Creative Multi Speaker Surround (CMSS) effects modes – 'Movie' and 'Music' – that you can apply to any sound source not using some other surround method. The CMSS modes take just the front stereo pair and 'upmix' it to a decent 5.1 speaker mix. The Movie setting gives a big-theatre effect and Music has less reverb. Or, of course, you can just listen to un-effected two, four or six channel input.

There are separate level knobs for the surround, centre and subwoofer channels, as well as a 'test' mode that plays white noise through each channel in turn, so it's easy to tune the output to perfection.

You also get a small infra-red remote control that lets you change all of the major settings. The control panel has a motorised volume knob, for extra pose value: it feels a bit heavy when you turn it by hand, but that just encourages you to show off with the remote. And there's even one slightly downward-facing speaker stand along with the five forward-firing ones, so if your centre speaker's on top of your monitor, you can use that stand and aim it at your face.

The weakness of this rather expensive speaker system is, well, the speakers. The satellites are simple plastic sealed-box units with drivers only a little more than two inches in diameter, and the centre speaker's only barely larger. The sealed-box 'Symmetrically Loaded Acoustic Module (SLAM)' subwoofer looks as if it's got an eight inch driver. Unfortunately, that's not a speaker: it's a passive radiator (what Creative calls a 'Slave Diaphragm'). Inside the partitioned subwoofer box there's a single none-too-beefy six inch driver.

In listening tests, the Inspire 5700 sounded, well, OK. Not awful. Not great.

Yes, it does all of those surround modes, and the three level knobs are very handy. The 5700's respectably loud, too, despite the fact that the whole rig only runs from a 60 volt-amp outboard power supply. The sub's designed well enough and solidly enough constructed that it doesn't rattle or honk or buzz even if abused, and its no-port design means you probably won't have to muck about positioning it. But it doesn't have the poke to rattle your windows.

If you want to upgrade the speakers, you can: graft an RCA-plug cable onto any five four ohm speakers and you'll be able to use them with the Creative controller. Conventional eight ohm speakers will be a bit quiet, but you could always use a pair of eights in parallel! There's also a separate line level subwoofer output, which makes it easily convenient to connect a more serious powered sub.

If you want a PC speaker system with a tick in every box on the feature chart, this could be the one. But we've been spoiled by the Logitech Z-560, also reviewed in this issue. That's only 4.1 channel and doesn't have any surround decoding features, but it's got better quality satellites and a freckle-kicking subwoofer with a real high power eight inch driver. The Inspire 5700 just, well, isn't inspiring by comparison.

If the 5700 was cheap, it'd be brilliant. But for $899, you can start thinking about proper home theatre gear. So, unfortunately, the Inspire 5700 falls between two stools. Given time the price will surely fall. Then it all changes.

SPECIFICATIONS

5.1 channel speaker system with multiple inputs and full surround features

Web site: www.creaf.com

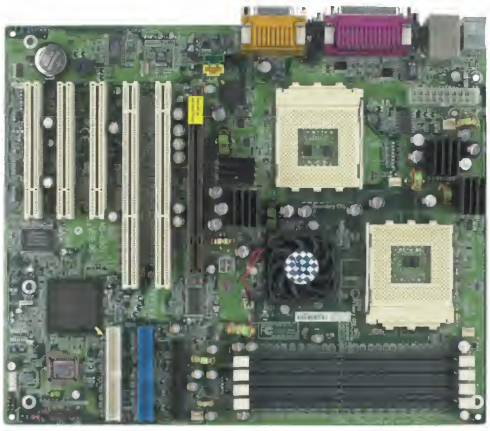
Supplier: Creative www.creaf.com

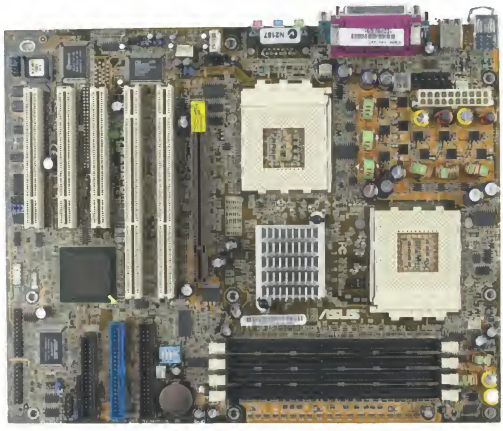
Phone: Creative (02) 9666 6100 **Price:** $899

atomic 6/10

AMD 760 MPX

Live out every AMD lover's fantasy: two Athlons at once, with John Gillooly.





The single processor version of AMD's 760 chipset may be a thing of the past, but AMD is pushing on into the SMP (Symmetric Multi Processing) realm with the 760 MPX chipset. The original 760 MP chipset was hobbled by an agreement with Tyan which led to only one motherboard on the market. This second attempt at a chipset for the fledgling Athlon MP range of processors should hopefully manage to reach a wider audience thanks to strong support from motherboard manufacturers.

The new chipset varies only slightly from the original MP chipset, adding support for PCI-64, integrated audio and an oblique reference to the XP moniker. MPX stands for Multi-Processor eXtended performance, and continues the IT tradition of inventing new and exciting ways of bastardising English language words that contain the letter X.

Retaining the 762 Northbridge from the 760 MP chipset, the MPX differs in the inclusion of the new 768 Southbridge. Changes to the Southbridge mainly revolve around the inclusion of two PCI buses, the familiar 32-bit/33MHz PCI bus that lurks on current motherboards and the next generation 66MHz/64-bit PCI 64 bus. The PCI 64 slots are longer than normal PCI slots and are keyed in a way that stops the use of normal PCI cards.

The other major addition is AC97 integrated sound support. This is a poor audio option for home users, however for servers or workstations this allows for basic audio functions (so you can hear when your OS isn't happy with you) without added bells and whistles that will probably never be used.

If you believe the mixed messages emerging from AMD, the MPX chipset only supports the Athlon MP processor. One neat little (obviously unintentional) feature of the AMD 760 MP chipset was that it would happily run any Socket A Athlon or Duron in MP mode. Unfortunately the motherboards were so feature packed and overpriced that there was never any danger of a dual Celeron style explosion in the home market.

Seeing as the 760 MPX should be powering much cheaper boards, it's in AMD's interest to somehow lock support for multiprocessing in every CPU but the Athlon MP. This has allegedly been done; but it seems the physical locking of the MP functions will be at the CPU level and not at the chipset level.

Last but not least, the MPX hides a dark secret. In the first iterations of the boards there is no USB support, due to a somewhat major stuff up at the chipset level. Despite the fact that AMD is adamant that the problems will only emerge under certain configurations, manufacturers are already concerned enough to offer interim solutions. ASUS and MSI are dealing with this by bundling free USB 2.0 PCI cards with every board.

The contenders

We tested two AMD 760 MPX based motherboards: the ASUS A7M266-D and the MSI K7D Master-L. Both were tested under Windows XP Professional using 256MB PC2100 DDR RAM and two Athlon MP 1600+ (1.4GHz) CPUs. We benchmarked with SYSmark2001, Lightwave and Quake 3: Arena.

SYSmark doesn't specifically support SMP systems, however as our results demonstrate, some applications within the Internet Content Creation benchmark do take advantage of two CPUs. Both Lightwave and Quake 3: Arena have multiprocessing

▲ MSI K7D MASTER-L

AMD 760 MPX chipset, two PCI-64 slots, AC97 audio, four DIMM slots, integrated LAN

Web site: www.msi.com.tw

Supplier: MSI www.msicomputer.com.au

Phone: MSI (02) 9748 0070 **Price:** $630

atomic 8.5/10

▲ ASUS A7M266-D

MD 760 MPX chipset, two PCI-64 slots, AC97 audio, four DIMM slots

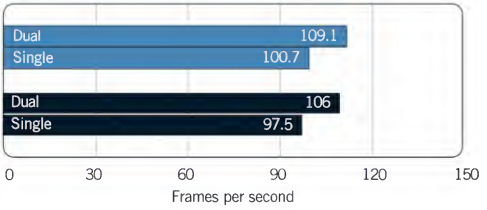
Web site: www.asus.com.tw

Supplier: Cassa www.cassa.com.au

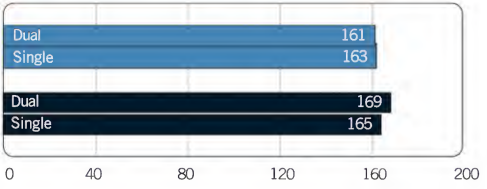
Phone: Cassa (07) 5445 2992 **Price:** $600

atomic 8.5/10

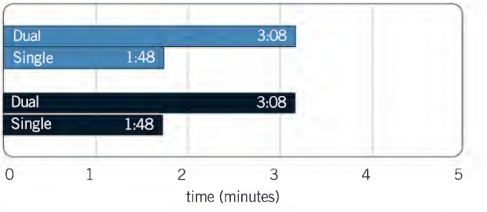
Quake 3: Arena



SYSmark2001 - OP



Lightwave Raytrace benchmark



support that can be toggled, and results have been compared between single and dual CPU performance for both.

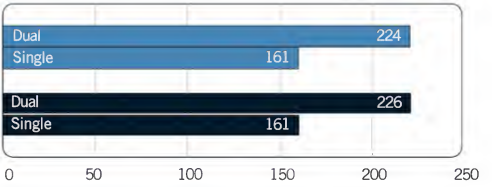
The boards share many similarities: both sport three 32-bit PCI slots, two PCI-64 slots and an AGP 4x slot. There are four DDR DIMM slots, but only the first two slots support the common desktop unbuffered RAM variety, and only up to 2GB. In order to cram 4GB of DDR into the four slots you will need more expensive registered DIMMs.

Each board is capable of running one or two CPUs, which are supposed to be Athlon MP processors. However, they both ran stable in MP mode with the essentially identical (but cheaper) Athlon XP processors. This may be the case because the boards are early revisions, or that our Athlon XP processors are early enough versions to still be MP compatible.

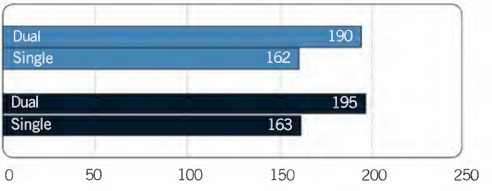
Reports are mixed on getting non-Athlon MP processors to work, but it is definitely a risky proposal getting it working.

Our benchmarks show the huge boost in performance that comes when software supports SMP. In SYSmark2001, the extra CPU made huge boosts to the Internet Content Creation tests, increasing the eventual score by almost 40% over a single CPU system.

SYSmark2001 - ICC



SYSmark2001 - Overall



MSI K7D Master-L

ASUS A7M266D

The Office Productivity tests, which don't use any SMP supporting components, showed virtually no difference between single or dual processor configurations.

As usual, the Quake 3 SMP results show minimal improvement when SMP is used. Seeing as this is one of the few games that actually bothers with SMP support, this really does push the fact that multiprocessing is overkill for gamers.

We used the built in Raytrace benchmark scene in Lightwave, with the scene drawn first using a single thread and then using two threads. Both boards showed almost identical performance, with rendering time almost halved when using two threads.

The graphs demonstrate just how close these two motherboards are. They both have some basic tweaking options, but at its heart the 760 MPX chipset is not for tweakers. There are no real overclocking options on these boards as the aim is for a stable platform for specific purposes. These are targeted at the workstation/small server market, and the lack of any real benefit for gamers means that dual Athlon systems are a pure indulgence for the home user. If we do eventually see games that take better advantage of SMP then this outlook will certainly change, but games will not start properly supporting SMP until there is enough demand.

If you fit into the multiprocessing niche, then the Athlon MP is already a highly competitive option, and with the arrival of widespread motherboard support, it is becoming more attractive by the day.

Zalman CNPS6000-Cu

If there was ever an award in Atomic for the most freakishly designed piece of kit, there is no doubt that this HSF from Zalman would take the honours. Featuring a revolutionary new shape reminiscent of an Oriental fan or a randy Peacock, the CNPS6000-Cu is designed to remove CPU destroying heat whisper quietly.

The 80mm fan has to be mounted on a moveable arm attached to the PC case, not the heatsink. As well as the heatsink and fan, the pack contains a Zalman RPM adjustor, a special mounting tool and a small tube of thermal paste.

Installing a Socket A heatsink can be a nerve wracking affair, but the installation tool makes it a simple and safe process, even in the restricted confines of a cluttered case.

We tested this HSF on our new Athlon testbench, with its Athlon XP 1800+ (1.53Ghz) CPU. Our standard heatsink tests were run with this HSF in place, as well as with a Globalwin FOP-38 for comparative purposes. Load temperature was a cool 39C, which compared well with the noisy FOP-38's 36C. Considering that the Zalman is barely audible even when the RPM adjustor is set to top speed, this is a significant achievement.

Idle temperature for the Zalman was 34C, compared to the FOP-38's 33C; again an amazing achievement for such a quiet unit. It must be noted that we tested the unit outside of a case, and the performance of this HSF would likely be dependent upon decent airflow within a case to do as well when in normal operating conditions.

At only $85 for an all copper HSF, this unit is priced very competitively. Considering its ultra quiet operation and impressive performance, this unit is an amazing example of a revolutionary design that actually works. If you're after a quiet HSF that still does the job, look no further.

SPECIFICATIONS

Copper construction, rated to 1.5GHz+, weight: 460g, Case mounted cooling fan.

Web site: Zalman www.zalman.co.kr
Supplier: Quiet Computers www.quietcomputers.com.au
Phone: Quiet Computers (07) 5543 1945 **Price:** $84.95

atomic 9/10

Zalman RPM Adjustor

As AMD's steamy Athlon chips have become popular over the last couple of years, it has been next to impossible to find an AMD box that doesn't sound something like a B-52 warming up before take off. Case fans have become a must for supplying cool air to the CPU HSF, but the noise levels associated with these have deterred some people from the AMD route. It's no surprise then that fans with adjustable RPM, as well as fan buses, have started to become a popular option for controlling noise levels while keeping air flow at acceptable levels. But what are you to do if the fans you've already installed aren't RPM adjustable, and you don't have enough fans to warrant the purchase of a fan bus? The Zalman RPM adjustor is designed for people like you.

This device is designed to handle fans with a start up voltage requirement of 5V or below. If your fan needs to draw more current than this at start up, you won't be able to use it. The maximum wattage that this device can handle is 6W, so make sure your fans don't exceed this requirement or you'll soon be smelling the tear-jerking scent of components going into meltdown mode.

To install the RPM adjustor, simply plug your fan into one end of the device, and then attach the adjustor to your usual 3-pin fan header. You will then be able to control the speed of your fan from 20% up to 95% of the maximum speed. Unfortunately, when using the adjustor all motherboard fan monitoring is disabled, so you'll need to disable any BIOS fan speed warnings as the fan speed will show up as zero. This can cause some PCs to shut down as soon as you try to boot the system up.

The RPM adjustor is a little ungainly, as the control for adjusting the speed will be located inside your case, so if you've only got one or two fans that need to be tamed then it makes for a quick and easy fix. If you've got any more than that, and most of you will, a fan bus is a much more efficient and convenient option.

SPECIFICATIONS

Control fan speed from 20% to 95% of maximum speed, 3-pin connector.

Web site: Zalman www.zalman.co.kr
Supplier: Quiet Computers www.quietcomputers.com.au
Phone: Quiet Computers (07) 5543 1945 **Price:** $12.95

atomic 6.5/10

LinkSys Wireless Access Point

Tremayne Sargeant discovers that networking doesn't have to be a hair tearing affair.

Besides the mouthful of a name, this little box is more than it appears. The basic concept behind it is to merge the most common network components together into the one package, running them off one common back plain or data bus; and the end result is a saving in time, space and cost. When first told of this little device I must admit I was skeptical. If you want to setup a network you buy individual components, switches, routers, a few NICs and lots of cable . . . you disappear into a room for a few hours and work your magic on the little buggers. In the end – hopefully – you get a fully operational network. You don't simply purchase one little box, plug it in, add PCs and end up with an instant network. But the LinkSys EtherFast is just that: a 4-port switch, a router with a NAT Firewall, and an Access Point for a wireless network. Surprisingly, not one of the functions has been skimped on.

For those people that actually read user manuals included with any given product, the network should be up and running in minutes. Even those of us that jump in and play, using the manual only as a last resort, will have this little box installed and running in short order. The only stumbling block that comes to mind, if you don't read the manual, would be the IP address and password for admin access to the box. As with many of these plug and play network devices, administration is via an HTML front end. Presenting the user with a simple menu system, it allows you to quickly change what can at times be confusing settings with ease. Even if you do get stuck, every setting is clearly labeled, and unlike some products the manual and online help files are actually quite useful.

The initial setup for both the router and your machine is simple. Connect everything together and then turn on the router before watching it go through its quick boot process. Once it's booted you just need to power up your machine. By far the easiest method for using the EtherFast is to set your machine up to use DHCP to assign IP addresses and DNS information. The default IP range used is 192.168.1.0 on 255.255.255.0, with the EtherFast using 192.168.1.1 as its LAN interface. Once your machine has been assigned an IP you can then access the admin pages. To do this, open your Web browser and type in the IP address of the EtherFast in the address bar. A username and password prompt will cheerily greet you; by default the admin user name is blank and the password is 'admin'. For most users the only information you would really need to place in here is the ISP information if you need to assign it manually.

'work your magic on the little buggers. In the end – hopefully – you get a fully operational network.'

On the Wireless side of things, the EtherFast is just as quick to setup and just as easy to use as the other functions it performs. The box is WiFi compliant so it should support existing wireless networks and other manufacturers' network adaptors. Under basic testing here in the Labs the signal was picked up around 25 metres away – although this is 5 metres off the claimed 30 metre limit, there was a lot of background interference so the range and speed we reached were impressive. The network adaptors come with some very handy software tools, unlike some of the major wireless companies, and the site survey and monitoring tools were found to be very accurate and useful while testing.

As this is a fairly well rounded product it could be used in almost any situation. It is perfect for small businesses to setup an inexpensive network and by connecting to relatively cheap service providers any small business can now setup a professional looking in-house network, running their own mail and Web servers, with the added bonus of wireless networking. Alternatively the EtherFast can also be used in a home network where you have multiple machines wanting fast access to the Net. In all this is a great product with the added bonus of being very well priced considering all of its functions.

SPECIFICATIONS

4 Port Switch with uplink, Router with NAT Firewall support and WiFi compatible Wireless Access Point.
Web site: www.linksys.com
Supplier: Multimedia Technology www.mmt.com.au
Phone: (03) 9837 2500 **Price:** $640 (Router), $320 (NICs)

atomic 8.5/10

Opal Platinum System

John Gillooly checks out the Platinum, now with added Titanium!

The Platinum system from Opal is a winner in the looks department and is also jammed with the latest in hardware. Inside the Lian Li PC65 case sit all the ingredients for a kickarse performer. The performance combination of an Athlon XP 2000+ CPU, Epox 8KHA+ mobo, GeForce3 Ti 200 and 512MB of DDR RAM shows a lot of promise, as do the included Creative Audigy Digital Entertainment soundcard, 100MB Western Digital HDD (with 8MB cache) and Ricoh CDRW. In fact, a lot of the components within are past winners of Atomic Hot awards.

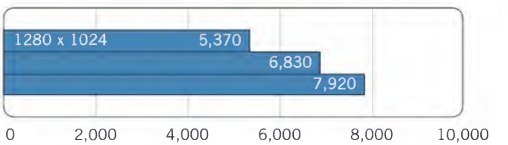
The system itself is well put together, with the inbuilt perspex panel of the PC65 case showing off the nicely cable tied power cables, and the rounded IDE cables. One rather minor gripe is that the excess plugs on the IDE cables are neatly tucked and folded down near the 3.5 inch HDD bay. This does obstruct the airflow coming through the front intake fans on the case, and is a common problem when tidying away cable in a Lian Li.

We tested the Platinum with SYSmark2001, Quake 3: Arena and 3DMark2001. The system delivers some great scores, especially in 3DMark2001 Pro and Quake 3: Arena, thanks to the powerful Athlon/KT266A/GeForce3 Ti 200 combo. This is definitely a good gaming machine.

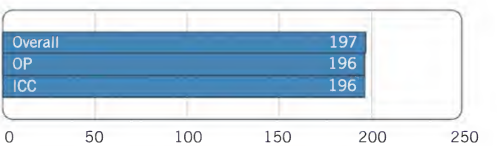
Which brings us to one other problem. The system comes standard with a Hercules ProphetView 15" TFT screen, which will act to hold your system back from attaining the high resolution gaming glory that it deserves. The monitor is great if you aren't too gaming focused, and certainly looks sexy, but anyone who is after some serious power will choose the optional Auriga 19inch CRT screen over the TFT any day.

The gripes with this system are minor, but the performance is more than adequate for modern gaming needs. It is a system that can definitely hold its own against the rest of the systems that are out there in the looks, sound and performance stakes, but this comes at a price.

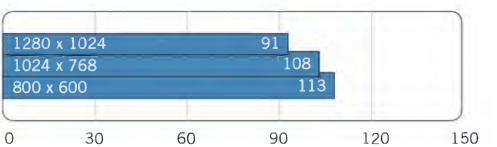
3DMark2001 Pro



SYSMark2001



Quake 3: Arena



SPECIFICATIONS

Athlon XP 2000+, GeForce3 Ti 200, Creative Audigy DE, Lian Li PC65, 512MB DDR, Altec Lansing ACS54 speakers

Web site: www.opaltech.com.au

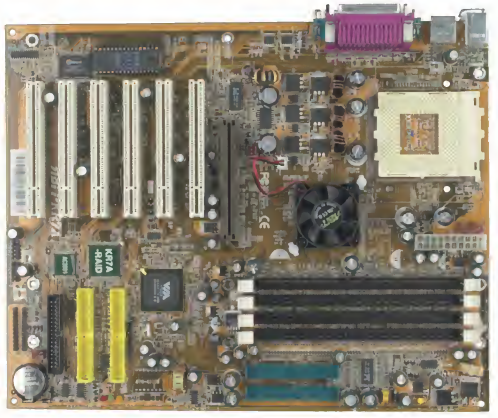
Supplier: Opal Technology www.opaltech.com.au

Phone: (03) 9806 0962 **Price:** $4,980

atomic 8.5/10

ABIT KR7A-RAID

ATA133 RAID on Mobo. John Gillooly tests ABIT's next step in DDR.



The KR7A-RAID may be a new motherboard, but it has an interesting legacy. The board was first announced last year, when it was to sport VIA's KT266 chipset and come hot on the heels of ABIT's first Athlon DDR board, the AMD/VIA hybrid KG7-RAID. However the board was delayed in the face of the relatively poor performance that the first iteration of the KT266 chipset showed.

Thankfully, VIA eventually got around to producing the updated KT266A chipset, sporting a new DDR controller which rectified the problems and helped motherboard manufacturers deliver the performance that was promised when DDR RAM was first launched onto the market. Thus the KR7A was born. The board stands out with little touches, like the rare use of four DDR slots and the icing on the feature cake, a Highpoint HPT372 ATA133 IDE RAID controller onboard.

There are already a swag of high quality KT266A motherboards on the market, of which the current feature king is MSI's K7T266 Pro2-RU, and the performance title is held by Epox's 8KHA+. To see how the KR7A-RAID fares in this company, we tested it using the same specifications that were used for our Athlon DDR motherboard roundup in Atomic 12. The board was tested using a GeForce3 Ti 500, 256MB CL2 PC2100 DDR RAM and an Athlon XP 1800+. The tests were run under Windows ME, and appropriate changes were made to the AGP aperture to fix the bug that reduces system perfromance under this configuration.

In SYSmark2001 the KR7A-RAID fell just short of the other boards, but by a fairly insignificant margin. In Quake 3: Arena, again the gap was close, but the KR7A-RAID managed to just scrape ahead of the Epox 8KHA+ and beat the K7T266 Pro2-RU by five per cent.

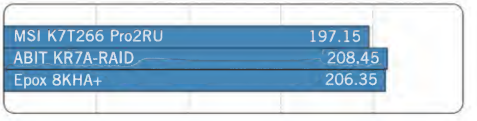
The performance differences are pretty much negligible, but they do mark the KR7A-RAID as a bleeding edge performer in the DDR stakes. Add to this the powerful SOFTMENU III overclocking tools and extensive tweaking options and ABIT has produced yet another board that stands out from the ever-expanding pack. As is always the case with ABIT, the best rewards will be reaped by those who are unafraid to delve into its BIOS, but even at performance defaults this board flies. Like its predecessor, the KG7-RAID, this board features four DDR RAM slots, which is still incredibly rare on KT266A motherboards.

'...the best rewards will be reaped by those who are unafraid to delve into the BIOS...'

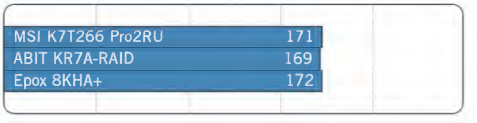
The addition of the Highpoint ATA133 RAID controller is a plus, however it is still unclear just how many ATA133 drives we will see, with some makers planning to skip it entirely and go straight to the superior serial ATA technology later this year. One unfortunate problem with the Highpoint controller is that is doesn't properly support ATAPI. This means that you can only run IDE hard drives off the controller. This should not be too much of an issue for the average user, but it does restrict the flexibility that IDE RAID controllers offer to the end user.

In a market that is overflowing with attractive motherboard options, ABIT has yet again shown why it has a great reputation amongst enthusiasts. The board may look drab and ordinary, but the performance it delivers is well worth the price of admission.

Quake3: Arena



SYSmark2001



SPECIFICATIONS

VIA KT266A chipset, four DDR Slots, six PCI slots, HPT372 ATA133 RAID controller

Web site: www.abit.com.tw

Supplier: Synnex www.synnex.com.au

Phone: 1300880038 **Price:** $399

atomic 9/10

A long, long time ago...

Six gamers walked into a bar... (no joke – John Gillooly was there.)

They were all into LANning so they formed a clan – to have fun.

In January Ben, Bennett and myself had the great pleasure of heading down to Melbourne and checking out the Atomic WorldLAN GibFragCon 97: XP. Now, over the past year I have become more and more jaded with LANning, with the shift away from the fun community atmosphere seen at big events towards hyper-competitiveness, driven largely by what CounterStrike has now become.

I'm well aware that this is probably going to sound like a self-indulgent wank, but there is a point to it, so forgive my egomania.

I had the great joy of being one of the gamers who discovered CounterStrike early on in the piece, and I have many fond memories of LANning beta 1.

It was perhaps one of the most enjoyable gaming sessions of my life, because it was new, fresh and above all: fun.

It took a little while for me to make the transition to regular online CounterStriker, but when I eventually made the jump it was a revelation. In CounterStrike a lot of us found more than just a game: we found a group of really great people (for the most part) who were all out there to have fun. There were no cheats. Fluke shots were met with a chuckle and maybe a cry of 'Bullshit!', but it was never really considered that someone would deliberately set out to cheat and ruin the experience. Even the team killers and name users never lasted long under the weight of public opinion.

Through this early time in CounterStrike's online history I was an active part of a clan called Total Consciousness which had been formed by a group of old university bar regulars and was firmly rooted in the belief that we played CounterStrike to have fun first and foremost.

By some weird fluke, we actually developed into a competitive clan with some notable victories and also some notable losses as the months progressed.

Then the scene as a whole slowly shifted: even before the cheating problems emerged, the inter-clan rivalry approached new levels of supreme idiocy, fueled by a fast growing obsession with being the best clan in Australia (always forgetting that there was also a West Coast, but that's another matter).

This fierce competitiveness was not entirely bad: initially it made for an extra level of intensity in clan matches, and when inter-clan rivalries verged on blowing up there seemed to still be enough of the old crowd around to temper the conflict.

LAN events were changed in a less-than-positive way as fairly decent cash prizes started popping up, and clans started to travel to attend the big LANs all over the country for the money and glory.

There were plenty of smaller clans – groups of friends who were out to have fun – that often suffered the indignity of being steamrollered by a clan that had spent months training and developing its tactics. And the funny thing was that these smaller clans seldom griped. It was fairly obvious that only the big competitive clans got into the arguments.

The vibe changed. Several LAN organisers that I have chatted with over the past year or two have acknowledged that CounterStrike comps were more stressful than anything they had run in the past, and a lot of them would have been quite happy if the stress caused by competitive CounterStrike events just went away.

I had one of the best days of LANning during that period at an event in Sydney where we played in the CS comp and then had a friendly match with a clan called FBi.

After a truly amazing game of CounterStrike, they suggested we all play a game called Codename Eagle, and being the curious people that we are we decided to give it a go. We proceeded to have an awesome time, playing this game that we had never heard of: sure it was buggy and problematic, but it was fun.

When it comes down to the basics, that is what LANs should be about. Not bitching and moaning about clan matches because you can't deal with losing (or winning), but trying new stuff, playing those games you never normally multiplay, and just socialising with likeminded people. Sure, if you walk away with a few hundred bucks earnt through your highly refined CS skills, then good for you. But wouldn't it be better wandering away with a new gaming addicition and maybe having met more people that you can really consider friends?

The whole notion of Pro Gaming is a funny one, which I haven't even begun to cover here. I'm not against it: I think there is a niche for it and it will take off one day, but hopefully not at the expense of what LAN events are there for. One more time for the record: LANs are above all about meeting new friends and having fun.

The WorldLAN was one of those events. The overwhelming result was that people walked away from the event happy, and the countless posts on the forums are testament to this. Thanks to MODZ, Mael and all the Atomicans who forked out their time and money to put on an event that restored my faith in LANning.

Medal of Honour Allied Assault

Bennett Ring spends a day at Omaha Beach catching rays and plenty of Nazi lead.

Bennett's pruning method was unorthodox but very effective for producing good grapes.

Omaha Beach: beautiful one day, hell hole the next.

Responding to the Platoon leader's call of 'Covering Fire!', the entire squad opens up in the direction of the enemy contact, covering the Nazi firing position in a cloud of dust and debris. As Jerry ducks behind any available cover to avoid the lead hailstorm that is now raining down upon him, I seize the moment to sprint across the road to a building that had been devastated in an earlier artillery attack. I use the word 'sprint' loosely, as a fully armed and battle gear laden soldier won't be breaking world 100-metre records any time soon. Puffs of dust leap out of the ground to my front and left as an enemy HMG gunner, stupid enough to fire back, stitches a row of new holes in the dirt around me. The crack of a sniper's bullet passing within inches of my face prompts me to zig and then zag, making this moving target even harder to hit. Seconds feel like hours as the doorway to safety looms ahead, but I'm almost there. With only inches to go a German hand grenade bounces into the room, thrown by an unseen attacker. Before I can stop and double back across the street, a wall of shrapnel tears me off my feet, and I depart this mortal coil. Thank God this is only a game.

The Medal of Honour series made its debut on the PS1, but it seemed that platform didn't quite have the necessary grunt to pull it off, as it suffered from frame rate and AI problems. Knowing its console origins, we weren't exactly holding our breaths in the hope that MOHAA would be a PC classic. How wrong we were.

In MOHAA you play the role of Lieutenant Mike Powell, a 'special infantry' soldier with Ranger-level training from the Office of Strategic Services (OSS), thrust into the final days of the European campaign of World War II. That's right, it's time to polish off the old Nazi arse kickin' boots once again; just make sure you get that gloop of Wolf turd off the bottom before you begin ;). There's no denying what great targets Nazis make – there aren't many other groups in history whose followers are so deserving of a bullet to the forehead. As a member of the OSS, you'll partake in a variety of mission types ranging from sabotage, to subversion, search and rescue. This is one of the key reasons MOHAA is bound to be a success, as each of the six missions has a very different feel to the others. In one mission you'll be manning the .50cal machine gun on the rear of a jeep as it launches an assault on an airfield; while in another you'll spend most of your time crouching in a loft, sniping at Germans as they try to blow a crucial bridge. Most of the missions have you traversing the level by foot, but the occasional bit of vehicle based violence helps to spice things up. The Greatest Mission Ever Seen In A Game', the Omaha Beach landing, deserves a review of its own, and makes the RTCW beach assault look like it was designed by a group of six year olds.

While there are only six missions all up, each is divided into three or four sections, giving you a total of around twenty 'levels'. The average gamer can expect to complete all of these levels in around 12-15 hours, which is reasonable considering the glut of 8-10 hour games released these days.

The gameplay style is a weird hybrid of arcade blended with realism. The physics engine is definitely of the realistic variety, resulting in your character being the equivalent of the extinct first person shooter sloth – easily the slowest character movement found in a first person shooter yet. Weapons must be accurately aimed, with recoil effects making full automatic fire useless for anything but the closest of encounters. This realistic side is balanced out by large waves of enemies that you need to take down, leaving you with barely any time to catch your breath between contacts, as well as the aforementioned shooting sections. Somehow these two contrasting styles manage to gel, offering a style of gameplay exponentially more enjoyable than games that only focus on either arcade or realism. We're sure there will be some players who don't get the same kick out of this mutant fusion of two game types, but heck, we loved it.

High AIQ

Enemy and teammate AI is also exemplary, equalling even the much-admired grunts in Half Life when it comes to acting like proper live cannon fodder. They will hide behind walls when you fire at them, poking only their guns over the top to fire at you, and flank you to one side if you're not careful. One of the coolest bits of AI programming would have to be their reactions to grenades: usually they'll all just run like mad to get away, but on the odd occasion one of them will be struck by a wave of heroism and throw themselves over the grenade to save their team mates, or retrieve it and lob it back. Inspired stuff. Needless to say, on the highest difficulty levels this game can be incredibly difficult, at times even a little too difficult.

The infamous Mr. Potato Head tries out his new arms with a German sniper rifle

The obligatory church level, with bonus Nazis at no extra cost

MOHAA is another game to use id Software's venerable Quake 3 engine, and the benefits are immediately obvious. Character modelling is at the same high level of detail of those within Return to Castle Wolfenstein, although the faces do have a cartoony look to them. The environments can be a little blockish, which is something most Q3 powered games suffer from, but all have a gritty, realistic feel that RTCW lacks. Thanks to the Team Arena enhancements to the Q3 engine, you will be doing battle in enclosed, close-combat environments as well as large, open air areas. In all, most people will find MOHAA to be a very attractive game. Due to the scope of the levels found within MOHAA, the system requirements are a bit steeper than those of RTCW or Q3:A, but a 1GHz CPU and GeForce2 level video card should ensure smooth gameplay with most of the graphic options maxed out at 1024 x 768.

When you're crouching behind a window frame watching bullets ricochet from the spot your head was approximately three seconds ago you'll start to notice some nice touches in the graphics, like debris from bullet impacts, or a couple of fighters screaming through the sky in the distance – all these little things help immerse you in the atmosphere of a busy, real life battleground.

If the graphics are impressive, which indeed they are, then the sound effects can only be described as truly mind blowing. It's no exaggeration to say that these are some of the finest sound effects yet heard on the PC, sounding as if they had been ripped directly from the opening scenes of *Saving Private Ryan*. From the zinging ricochet of a near miss to the crack of a shot from the Springfield sniper rifle echoing across the battlefield, the weapon effects are nothing less than stunning. Ambient sound effects are equally amazing: an example that springs to mind is a scene in a snowy forest, where the sound of branches cracking from the weight of the snow will have you checking your six regularly, wondering if it's a German patrol sneaking up on you. And the Germans actually speak real German, not English with crappy accents. Achtung Baby! This can make team commands a bit tricky to figure out in the multiplayer part of the game, but adds immensely to the realism of the game.

If you think the single player game sounds like a must buy, then you need to hear about the joy that is multiplayer MOHAA. While it has your traditional deathmatch and team deathmatch modes, the objective based mode is so addictive there should be some kind of warning label about it on the box. One of the teams has an offensive objective, such as blowing a bridge or storming a beachhead, while the other has to use gun things to stop this happening, resulting in a very CounterStrikey type of game. But, due to the enhanced graphics and awesome sound effects, the result is a game greater than the mighty CS. *Gasp* Did I really say that? Yes indeedy, MOHAA will be a CS killer – provided more maps are released. At release, MOHAA only has four of the brilliant objective based maps included, but you can be sure this will be rectified in the very near future, either by the community or by the developers. You just need to take a look at how popular the demo of MOHAA is to realise it will soon OwnzOr your multiplayer world.

If you've got the impression that this reviewer dug MOHAA, you're darn tootin' right. Not since the release of Half Life has a first person shooter done everything so right. If there is a flaw, it's that the ending is crapola, but that didn't stop Half Life from becoming many people's favourite first person shooter of all time. And neither will it stop MOHAA from doing the same. . .

atomic 9/10

GAME DETAILS

FOR: Incredibly immersive, gorgeous graphics with even better sound effects, intelligent AI.
AGAINST: Not enough objective based multiplayer maps, crap wad ending.

REQUIREMENTS: 450MHz CPU, 128MB RAM, 16MB 3D video card, 500MB HD space
RECOMMENDED: 1GHz+ CPU, 256MB RAM, GeForce2

SOUND APIs: DirectSound
VIDEO APIs: OpenGL

DEVELOPER: 2015 www.2015.com
PUBLISHER: Electronic Arts www.ea.com
DISTRIBUTOR: Electronic Arts www.ea.com
PHONE: Electronic Arts (02) 9264 8999

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Conquest: Frontier Wars

'Your Mantis style is no match for my Terran technique!' screams Des McNicholas.

Ship models are decent close up, but you need to stay zoomed out to exercise control.

Conquest makes the most of the 2D/3D space environment.

Fever Pitch Studios' Conquest: Frontier Wars has finally emerged from a torturous three year development cycle that included a new production team and a number of delays, but was it worth the wait? Maybe.

Conquest was always going to attempt a fresh approach to the RTS genre – with designers Chris and Erin Roberts of Wing Commander fame leading the way – but whether there are enough innovative ideas for the game to stand out from the crowd isn't clear yet.

Conquest throws players into the midst of a frontier war involving the good and honest Terrans (us), the apparently friendly energy fields known as the Celareons, and the evil expansionist insect-like Mantis.

What started as a Mantis civil war has expanded to include their long-term Celareon adversaries, and the Terrans have been dragged into it through geographic misfortune. Battles rage across star systems, giving players the opportunity to command multiple, widely dispersed forces.

Only one campaign (Terran) is included, although tutorials are available for the other races in preparation for multiplay via LAN, Internet or www.UbiSoft.com. A configurable Quick Battle mode is also available, and all completed campaign missions can be replayed individually.

While the basic mechanics of gameplay will be familiar to RTS veterans, Fever Pitch offers some interesting twists. Starting with an orbital Headquarters, players must quickly build the necessary assets to defend it, gather resources, and take the battle to the enemy. By linking construction to both resources and a Command Points system, simply massing forces has been discouraged in favour of consolidation and expansion. As new systems are discovered via wormholes, players have to juggle several balls at once and stretch their forces in the process. Most importantly, units have limited onboard supplies, necessitating the maintenance of unbroken supply lines between star systems.

These limitations pose more challenges than most RTS titles. Construction limits, maintaining situational awareness, and securing supply lines can be tedious, but doing them well is critical to success. You'll be rewarded with a host of tactical opportunities – supply lines can be attacked, weak points exploited, and wild goose chases initiated.

Given the complexity of Conquest, a stand alone tutorial along the lines of Homeworld would have helped, as would a better structured and presented manual. Fortunately, the early campaign missions are coached, the span of command increases fairly gradually, and the Quick Mission mode gives players a chance to work on key areas.

A good interface is critical in such a complex game, and Conquest does a reasonable job. The on-screen windows are too large, but they provide all the necessary information and are well supported by short cut keys. System and Sector maps are available at all times, and unit data is complemented by orders, stance and hot buttons. Warning lights and voiceovers draw attention to danger, and players can jump instantly to hot spots. Grouping and formation follows RTS conventions, as do build trees, movement controls, and upgrades.

In a smart move for such a dispersed battlespace, Fever Pitch includes a Fleet system, allowing forces to be assigned to subordinate AI commanders who act independently within broad guidelines.

Conquest: Frontier Wars probably doesn't live up to the hype that surrounded its long development, as some aspects of the storyline and game options have an unfinished feel to them and the emphasis on one race is disappointing.

Still, it shows considerable polish in many areas, looks impressive and offers excellent online play.

atomic 8.5/10

GAME DETAILS

FOR: Some new ideas, a strong interface, solid multiplay, and innovative command arrangements.

AGAINST: Steep learning curve, managing supplies can be tedious, and no campaigns for the alien races.

REQUIREMENTS: PII 350, 62MB RAM, HDD min 450MB, 8MB DirectX compatible video card
RECOMMENDED: PIII 500,16MB video card
SOUND APIs: DirectSound
VIDEO APIs: Direct3D

DEVELOPER: Fever Pitch Studios www.feverpitchstudios.com
PUBLISHER: UbiSoft www.ubisoft.com.au
DISTRIBUTOR: UbiSoft www.ubisoft.com.au
PHONE: UbiSoft (02) 8303 1806

Anarchy Online

Ashton Mills unleashes his anarchistic side in this futuristic Everquest clone.

Mmm, Mongol Burgers.

She's dancing, right?

Anarchy Online is Funcom's answer to the MMORPG craze, and it's lucky to get a good year run in before Star Wars Galaxies arrives, because when that happens there won't be any other MMORPG worth playing.

Unfortunately, it would seem this fear of the Dark Side has prevailed over Funcom, for AO has been released a little too early. The boxed version of AO is so buggy it's almost unplayable. Three hours of auto-patching later and the game is good to go – but still, what a hassle!

Invariably, AO will be compared to Everquest because it looks and acts like a sci-fi EQ. This isn't a bad thing: it shows Funcom has focused on taking stuff from EQ that works, and improving or dropping what doesn't.

For example, a big problem in EQ was the world economy, which would become unbalanced after a while with high-end items in abundance, so that even newbie players could run around in magical full plate fearlessly laying waste to everything in sight. In AO items require a certain level of skill to wield or you simply can't use them. And skills (of which there are 75!), of course, only raise when you level. Hence 'twinking' is eliminated. Spawn camping has also mostly been removed.

Players can choose missions from mission terminals randomly created just for them or their group alone. This might stop someone stealing your loot after five hours of game time in a mission, but the knowledge it was just randomised by the server greatly reduces your sense of involvement in the world because it doesn't matter if you don't finish the level.

There are just four humanoid race types in the world of Rubi-ka, the fictional planet where the background story conflict between Omni-Tek and the rebellious Clans takes place. You can choose twelve professions ranging from Spies and Enforcers through to Nano-technicians and Martial Artists, and as Professions make it easier for certain skills to rise, there's nothing stopping you mixing the skills required to multi-class. For example, a Bureaucrat can pump up his ranged attack skills if he wants – they just won't rise as fast as the Soldier's skills.

Character creation allows you to sex up your character in as sweet or perverse a manner as you wish. The ability to mix and match body types, hairstyles, skin tones, clothes/armour and weapons improves each character's individuality in the world. There's even a range of scripted emotions you can do on screen, from scratching your butt to dancing the flamenco. Everything about this game is big!

The number of items you can use, wield, wear or merge to create new items is just mind boggling: there are – to be exact – *thousands*. You'll find a myriad of weapons and armour types, casual clothing for both sexes, implants and augmentations to your character's body, tools to manipulate your environment, a vast variety of nano-programs (spells) and much more. There are even a few vehicles in the game.

Sadly, it is during a fight that one of AO's biggest problems shows up – lag – and from Australia you're often too lagged to take the opportunity to run during a fight. Death in AO is handled more gracefully than EQ, allowing you to appear mostly intact at 'save points' scattered throughout Rubi-Ka.

The gorgeous visuals provide some of the most impressive elements in AO: all the areas are intricately detailed, and in some places you're content to just stop what you're doing and admire the sunset. Such graphics come at a cost, of course, because even a 1.5GHz GF3 beast chugs along if all graphics settings are pushed to the max.

All up AO is a good attempt at the fresh sci-fi MMORPG genre. If you want to give up any pretence of a social life, this will do it nicely.

atomic **7/10**

GAME DETAILS

FOR: Sci-fi MMORPG with fantastic panoramas and plenty of world depth.

AGAINST: Lag is the big killer, broadband only players need apply.

REQUIREMENTS: Win95, 64MB RAM, 300MHz CPU
RECOMMENDED: 1GHz CPU, GeForce 3, 128MB RAM

SOUND APIs: DirectSound
VIDEO APIs: Direct3D + T&L support

DEVELOPER: Funcom www.funcom.com
PUBLISHER: Funcom www.funcom.com
DISTRIBUTOR: Red Ant www.red-ant.com.au
PHONE: Red Ant 02 9882 1222

Cricket 2002

Des McNicholas' ball handling skills are put to the (cricket) test.

Win with EA's new advertising banner impersonation feature. Be the flying cat!

And the crowd goes wild... EA Sports lives up to its motto

Despite not being American, cricket has a large enough following to provide a market for this niche title from developer EA Sports. The 2002 release improves markedly on the earlier PS1 title and maintains the high realism standards EA applies to all of its sports franchises.

Hyped as 'the ultimate cricket experience,' Cricket 2002 delivers a technically accurate and engaging simulation of the grand old game, incorporating (generally) expert commentary, excellent animations, and the traditional EA TV feel.

All aspects of the world of cricket are on hand, including Practice Nets to hone skills, Test Matches, Exhibition Matches, the World Cup, the World Series, the Sharjah Trophy and a Knockout Tournament.

Other scenario options include day/night games at all of the world's major cricket stadiums played at Easy, Normal and Hard difficulty levels (although the difference between Normal and Hard isn't that much). The excellent manual incorporates an abridged set of rules, and tables for ball, pitch and weather variables.

Cricket 2002's control interface is well presented and surprisingly straightforward, ensuring players will be lodging appeals and scoring runs very quickly. Bowlers simply select a type of delivery, position the aim point, and apply the necessary power to the ball. Fast, swing, off-spin, and leg-spin bowlers are all catered for, with each having an appropriate range of deliveries such as cutters, in-swingers, and flippers. Batting is a little more complex as players choose a stance, select a shot, add power, and decide if a run is on or not. A Run Assist option is available, and batsmen can choose front or back foot shots.

Despite the number of choices to be made, both bowling and batting quickly become intuitive – although batting is the far more enjoyable option in the long run.

Fielding can be automatic, or players can control such things as which end to throw the ball to, fielder placement, and diving, sliding and jumping. Most players will probably settle on the automatic option, as manual control takes three hands and doesn't really add much to the game. Either way, fielding captains can always change team or individual field placings during the game with EA's simple Fielding Editor, which includes 15 pre-set Normal, Defensive and Open Fields, and three Custom Fields for players to create and save. Limited-over fielding restrictions apply for one-day cricket, and custom fields remain in place for designated bowlers throughout an innings. Regardless of placing, AI players perform in accordance with their real-world Arm, Agility and Hands statistics.

Cricket 2002 offers a host of configuration and display options to aid decision-making and customise the interface. Batting, bowling and fielding statistics are available for all players, and location, pitch conditions, sky and temperature can all be set in Exhibition Matches. Players also have full control over team line-ups and batting orders, and the in-game Main Menu gives quick access to performance graphs, action replays, and an Autoplay mode to speed things up. The umpires are suitably realistic, with replays showing a mix of excellent and appalling decisions, and the Third Umpire pops up if needed.

Surprisingly, for an EA title, the well-recorded commentary is sometimes all over the place, which is a shame considering the heavy focus upon realism.

Overall, Cricket 2002 is an excellent simulation that does a great job of capturing all aspects of the game. It comes with a great mix of teams, stats, and options, all shown off by a terrific range of camera and replay features. As you'd expect, two player is much more fun than bowling fifty overs at yourself – fans can't expect much better than this.

atomic 8.5/10

GAME DETAILS

FOR: Looks great, highly configurable, and you can captain Australia. Great fun with two players.

AGAINST: The odd dodgy commentary, decision and animation. Poor AI. Occasionally dull single player mode.

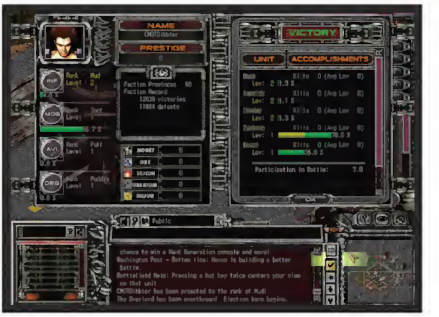
REQUIREMENTS: PS2 and Memory Card
RECOMMENDED: Dual Shock Controller

DEVELOPER: EA Sports www.easports.com
PUBLISHER: Electronic Arts www.eagames.com.au
DISTRIBUTOR: Electronic Arts www.eagames.com.au
PHONE: Electronic Arts (03) 9882 1222

Shattered Galaxy

George Soropos forgot to vote for a new Overlord, and now his dreams are...

It will cost you an arm and a left nut to get into Elvira's House of Pain, but it's worth it



You want stats? Then stat this!

Shattered Galaxy is the world's biggest massively multiplayer game right now (according to the PR blurb). Never heard of it? That's because two million Koreans have been keeping it to themselves for the last two years. Considering the popularity of the RTS genre it seems bizarre that a massively multiplayer variation has taken so long to appear, even more bizarre that it has arrived from South Korea. Oh well, it's here and it's good and that's all that matters now.

The strength of Shattered Galaxy as a game is its simplicity. Starting a game is a simple matter of selecting a name, a home planet (server) and a faction on that planet – then you're away. The in-game tutorial that guides you through all the key features of the game is good, and the publisher has also included a hefty manual as a nice touch.

Massively Multiplayer Online Role Playing Games (MMORPGs) provide you with a single avatar in their gameworld, which is simple enough to come to grips with, but how do you translate a real time strategy game into a persistent world when you obviously need a lot more than one unit to do battle? In the central hub of your faction a single character represents you: your commander, who is able to visit the various buildings that allow you to manage your forces.

Your commander has four different abilities that determine how your forces will develop: Tactics governs the number of units you can take into battle; Clout gives you access to more advanced units; Education provides better doodads for your units; and Mechanical Aptitude governs your ability to design new units. Experience points are added to your commander's abilities over time allowing you to customise them to suit your tastes.

Initially you can take six units into battle, but can own many more and use the extras as reinforcements. Even if your guys are destroyed in battle they are not lost. They can be repaired afterwards, allowing you to build up the skills and experience of your units as well as those of your commander. Battles are fought over POCs (Points Of Control) and these must be captured and held in order to win.

There are training areas in town for beginners, but the real action is out in the field. A battlefield map shows you all the territories in dispute and the status of the battles: closed, open or full.

But there is more to the game than combat. Overlords are elected regularly and take control of the overall situation by giving orders and adjusting foreign and domestic policy. Below the Overlord are regiments: groups of players that work together like a clan.

If you join a regiment then you will be expected to help team mates who ask for it and in return you can request help from them when you are in trouble.

Shattered Galaxy is by necessity unsophisticated in its presentation. The game runs in 800 x 600 only and the maps are on par with Starcraft in terms of graphic quality and complexity, but this allows the game to run quite smoothly. Despite the server location overseas, lag was only noticeable during large scale battles – and even then it was surprisingly bearable. Considering the lack of an Aussie server, this lack of lag is quite astounding.

With a free month in the box and $US5 a month thereafter, Shattered Galaxy is also one of the most affordable MMORPGs around. RTS fans bored with their usual online Age of Umpires battles and Yuri's Advanced Hair Alert 2 are probably ready for this.

atomic 9/10

GAME DETAILS

FOR: World's first online RTS in a persistent gameworld, clever structure and design, good character development, low specs required and a great price.

AGAINST: Only runs at 800 x 600; overseas server.

REQUIREMENTS: PII 233, 64MB RAM, 2MB Video, 250MB HD, 4x CD, DX Sound, 28K Modem
RECOMMENDED: PIII/AMD/Duron, 128MB RAM, 32MB Video, 600MB HD, 56K modem or better

SOUND APIs: DirectSound
VIDEO APIs: DirectX 7

DEVELOPER: Nexon
PUBLISHER: Tri Synergy www.trisynergy.com
DISTRIBUTOR: Red Ant www.red-ant.com.au
PHONE: Red Ant (02) 9882 1222

Twisted Metal: Black

'You're twisting my metal, man!' protests Des McNicholas.

Pretty lights give a nice illusion of speed, and vice versa.

Mad clowns on Mad Max trucks are reliably edgy.

After a good entry and an excellent sequel, a change in development house for the third and fourth instalments of the Twisted Metal series resulted in some very average games during a time when car combat games were losing popularity anyway.

So when Incog.Inc – sporting some of the franchise's original design team – announced Twisted Metal: Black, fans naturally had high expectations for the series. Thankfully, Incog has met the challenge well, producing a game that neatly combines the terrific pace and action of the series with the relative grunt of the PS2. It's admittedly more a matter of refinement than innovation, but TMB is the best combat racer available today, and one that is likely to hold its position for some time to come.

TMB's basic premise offers no surprises to veterans of the series, and some familiar (if twisted) characters put in a repeat performance: the evil Calypso is hanging around asylums again, offering to fulfil the deepest desires of any inmate prepared to drive a four wheel killing machine in the Twisted Metal Tournament. Calypso has no trouble recruiting the necessary crash dummies and they're not pleasant people. 10 characters are available up front, with five more unlocked as the tournament progresses across highways, city streets, prisons and skyscrapers. Single player options include Story Mode, Challenge and Endurance, while Death Match, Co-Op, and Last Man Standing are available for Metallers with friends.

TMB stresses action over configuration, so some players will be disappointed that cars can't be customised or swapped between drivers. Car and driver are selected together, after which the action takes off very quickly: the aim in each level is to kill all of the other drivers several times over, which sounds a lot easier than it is. Although it's supposedly every driver for themselves, the AI occasionally seems to team up, and it's not unusual to have to fend off two or three attacks at once. The upside is that players get multiple lives on each level, during which they can scout out the huge environments, develop tactics and find some ammunition. Just driving at speed is challenging enough on some levels, so ducking, weaving, aiming and trying to unlock characters all add an extra touch of excitement!

From tank-like trucks to speedy roadsters and pick-ups, the cars handle realistically relative to each other, and each is capable of phenomenal bursts of speed. Road conditions and momentum play a significant role in bad weather or confined spaces, but overturned cars are righted with a flick of the control pad, and death plunges are usually accompanied by another chance. Incog has provided three controller layouts, and the analog sticks finally give a decent driving option. It takes a little getting used to, but everything can be mapped to the sticks and top buttons to allow both driving and firing without much effort, and a Dual Shock really shakes things up nicely.

The Twisted Metal Tournaments are all about death and destruction, and TMB brings some very interesting ways to do both. Just about anything and anyone can be crashed through, run over or blown up, and a great mix of primary and special weapons is available.

Primary weapons are fairly standard, based around machine guns and rockets, but each car has a unique special weapon with extra punch. Everything from catapulted suicide bombers to morphing vehicles is accompanied by slick animations and stunning explosive effects.

Twisted Metal: Black is an excellent title that puts the series back where it belongs. It doesn't offer much that's new, but it looks great, rips along, and poses some very tough challenges.

atomic 9/10

GAME DETAILS

FOR: Staggering pace, looks great, excellent interface and huge environments.

AGAINST: Derivative rather than innovative, no vehicle customisation, and very steep learning curve.

REQUIREMENTS: PS2 and Memory Card
RECOMMENDED: Dual Shock Controller

DEVELOPER: Incognito Studios
PUBLISHER: Sony Computer Ent. www.scee.com
DISTRIBUTOR: Sony Computer Ent. www.scee.com
PHONE: Sony Computer Ent. (02) 9324 9500

Wizardry 8

Wizardry fans: the wait is over! Here is your new addiction, declares Ashton Mills.

The graphics engine is reminiscent of Everquest: simple, but at times beautiful.

Ye olde RPG view. Lucky it doesn't look like a FPS.

Wizardry 7 was by far one of the greatest RPGs in gaming history, so I sat back with number eight and waited to be awed. Except, at first, I wasn't. 'Hmmm... graphics aren't too hot', 'What's with the short view distance?', 'Items hovering above the ground, this is like Pac-Man!'

Silly me. I should have known better with a Sir-Tech game. I persevered, having recognised my view is tainted by so many games that emphasise tongue-slobbering graphics over gameplay, story, playability and attention to detail. Sir-Tech has held firmly to these four sacred values of gaming in Wizardry 8, and so, months later, I'm still playing it.

Flashback time. In Wizardry 7 the Dark Savant managed to finally retrieve the Astral Dominae, though you fought tooth and toenail to stop him. One of three artefacts of great power used to create the universe, legend has it that if the other two – the Chaos Moliri and Destine Dominus – are recovered and used in a ritual called The Ascension on the first planet ever made, Dominus, that one could become a Cosmic Lord, nothing short of a god. Hence, old Dark boy is set on the deed, and through a twist of events all three artefacts, and now your party, have come to be on Dominus. The Dark Savant, the Umpani, and the T'rang are back and the race is on to be the first to make Ascension.

If you have your Wizardry 7 save games lying around (that's real devotion!) then you can import them into Wizardry 8, and depending how you finished Wizardry 7, your crew will start in one of three different areas. This is your first sign that Wizardry 8 is not linear – the game can even be completed a variety of ways.

If you start anew you will create a party of six from an array of fifteen different classes and eleven different races: along with the usual fighters, clerics and mages you can build up bishops, ninjas, alchemists, samurai, lords – and new to Wizardry 8 – the gadgeteer, a sort of technological equivalent of the bard.

Races bring their own talents to a class, and the eclectic mix ranges from the stock humans, elves and dwarves through to the dragon based dracons, feline felpurrs, just plain odd mooks and a personal fave: the færie. One of the most feared combinations in this and previous games is the famed færie ninja. She's light and fast, so make sure your pickup line counts with this girl or she'll kick your face into next Tuesday.

Like the Jagged Alliance series your characters talk to you all the time through some excellent voice acting. You personalise each character with a voice style selected from nine different categories ranging from 'kindly' through to 'eccentric'. There is a total of 36 voice sets across all the categories for both genders, and given your characters have a large repertoire of comments to speak throughout the game, this is simply amazing attention to replayability and detail.

Battles are now more strategic: the fully 3D engine applies to the environment as much as the view, and monsters will now encircle your party, hacking away at those spellcasters you previously thought protected. Strategy is now a big element of combat, and epic battles are truly awesome.

The game includes over a hundred different creatures you can meet, pickpocket, chat to or just hack to bits, and there are nigh fewer than one hundred different spells to be cast. Lock picking is a joy to play with; character interaction and development is superb; the world map is huge; auto mapping is excellent and allows you to write in comments; and for the well hard gamers Sir-Tech has included an 'iron man' option whereby you can't save in game, only when you quit – understandably adding an entirely new dimension to the game.

I salute you Sir-Tech: you saved the best for last.

atomic 9/10

GAME DETAILS

FOR: Everything you ever wanted in an RPG. . .

AGAINST: . . .except for a dated graphics engine.

REQUIREMENTS: 233MHz CPU, 64MB RAM, 3D card
RECOMMENDED: 600MHz CPU, 32MB 3D card

SOUND APIs: DirectSound3D, Aureal A3D 2.0, EAX 2
VIDEO APIs: DirectX6/7 Direct3D, OpenGL, Software

DEVELOPER: Sir-Tech www.sirtech.com
PUBLISHER: Take2 Interactive
DISTRIBUTOR: Sony Computer Ent. www.scee.com
PHONE: Take 2 Interactive (02) 9482 3455

New York Race

Des McNicholas tries to get high in a New York taxi.

And you thought taxis couldn't get any crazier. This sucker can fly.

The game owes a lot to the opening of The Fifth Element.

The fast-paced flying and expansive aerial environments of New York Race are far better suited to this PS2 release than the earlier PC version, but despite some encouraging early previews, this high altitude racing game doesn't compete against the recent burst of first-rate PS2 offerings.

Kalisto Entertainment set out to produce a thriller inspired by the opening scenes and general atmosphere of The Fifth Element, but the result is arcade action rather than movie clone – where no time is wasted explaining the basic premise – dropping players quickly into New York's high altitude racing circuit in 2215.

NYR offers four game modes: Championship, Single Race (using the unlocked Championship tracks and cars), Time Attack and the Keirin elimination bout. The lack of any tutorial or initial single player races means players have to learn on the job in the middle of the Championship against seven AI opponents over four laps by day or night. The Championship is broken into successive Qualification: Beginner, Pro and Expert stages on 12 big tracks and most players will repeat the early levels several times until they come to grips with the subtle nuances of driving at high speed on air.

NYR multiplay is restricted to two drivers using a vertically split screen, and Dual Shock is supported.

Starting with a lowly GMT Photon taxi, players gain access to extra vehicles as tracks are unlocked, but the lack of initial options is a lost opportunity to drag players into the game. Cars are rated against each other in terms of speed, manoeuvrability, protection and acceleration (nosedive) capability, although there's not much difference at the higher difficulty levels and no tweaking is allowed. Three broad car categories are available: Speeders that trade armour for acceleration; Hovercars that balance the two; and Cruisers that opt for maximum protection and a Sunday drive.

Maximum speeds are fixed by the stage being competed, criss-crossing business sectors, Chinatown, slums and penthouses, guided (ish!) by coloured direction arrows and peppered with late-notice obstacles and narrow spaces. It all looks great, but Kalisto's track design is sometimes too clever, with too many blind alleys and too few opportunities to pick up speed – problems compounded by the fact that the AI drivers never seem to make mistakes!

Although the emphasis is on racing rather than combat, four attack and defence powerups are available, and mastering their use is essential in the early races.

As you'd expect in an arcade title, NYR has a fairly clean interface and a straightforward control setup. Screen information includes speed, strength, track map and ranking, as well as powerups and opponent locations. It's all nicely positioned on either side of the screen to allow a clear view through the towering skyscrapers, with the horizon indicator being the only real deficiency.

Remarkably, four controller configurations are offered for the relatively small number of commands, which consist of swerving, breaking, acceleration, powerup activation, and direction. Given the confined spaces and tight turns, most players will initially prefer the direction buttons, although analog sticks are the best option once flying skills improve.

On balance, far more work has been put into the excellent appearance of NYR than the gameplay itself, and players will lose interest very quickly once they learn how to control their cars. New York Race's solid arcade action and well presented race environments make it a good choice for the occasional quick burst of zero-G excitement, but this is probably not one for the long haul.

atomic **7/10**

GAME DETAILS

FOR: Fast pace, interesting track environments and terrific scenery.

AGAINST: No customisation, repetitive, direction is hard to maintain and the tracks are too complex.

REQUIREMENTS: PS2 and Memory Card
RECOMMENDED: Dual Shock Controller

DEVELOPER: Kalisto www.kalisto.com
PUBLISHER: Take 2 Interactive www.take2.com.au
DISTRIBUTOR: Take 2 Interactive www.take2.com.au
PHONE: Take 2 Interactive (02) 9482 3455

I-Opening

DOA? NFI? Can't RTFM? Easy, tiger, Dan Rutter likes nothing more than to help a distressed Atomic reader. A man of warmth, compassion and kindness, Dan wishes only that he could help more readers than the the lucky few on these pages.

Letter of the month: Meandering electrons

For posing the best question LOTM winner Chris picks up Fan Mate 1 RPM Adjustor PLUS a CNPS6000-Cu HSF, thanks to the funky people at Quiet Computers (07-5543-1945).

i I've changed my motherboard recently, and I noticed on my new and old boards they have curvy traces near some of the chips. I thought the traces were supposed to go directly towards the chip, not curve around like they do. Any ideas why this is so?
Chris Holzworth

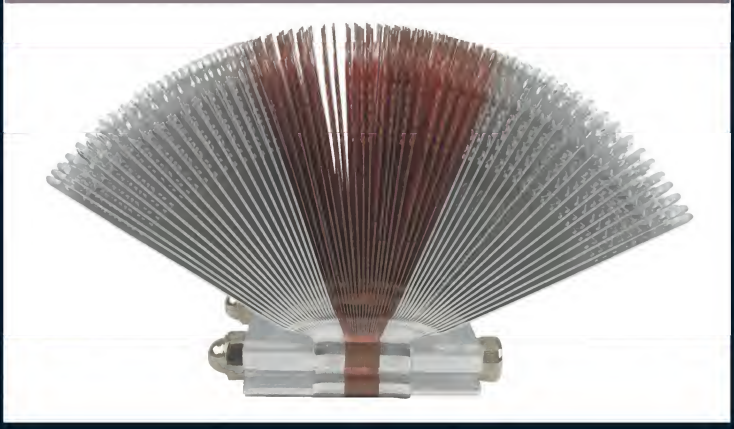
o Modern PC motherboards commonly have components that talk to each other at 100 or 133MHz. Tweaky overclockers' boards can already work at Front Side Bus speeds well above 166MHz, provided they're not let down by other components. As I write this, cryogenic-cooling speed-record nutcases are routinely hitting FSB speeds above 210MHz on Athlon boards. And yes, that means a CPU-to-chipset speed of more than 420MHz.

Let's say you're signalling at a mere 133MHz. When 133.33 million signals are going past every second, each one lasts only 7.5 billionths of a second. In 7.5 billionths of a second, light in a vacuum only moves about 2.25 metres. Signals in a circuit board trace move at around two-thirds of the speed of light – about 1.5 metres per 133MHz clock tick. At 200MHz it's only one metre.

The problem motherboard designers run into here is that multi-pin parallel data connections must be very tightly synchronised. Yet it's impossible to connect various multi-pin components together in such a way that the distances between the data pins that need to be connected are equal. And different signal trace lengths mean different signal delays.

Ground pins, power pins and other things that aren't running at some outrageous clock speed, don't matter. But if you want your data to stay synchronised (and you do – the alternative is ugly performance-eating buffering) then you need to make your data traces from Component A to Component B all the same length. The way you do that is by putting extra spirals and switchbacks and curlicues in the traces that would otherwise be too short.

Trace length isn't the only factor. There are capacitance, resonance and resultant signal settle time issues as well; when you're dealing with high speed digital systems you end up fiddling with a lot of analog variables. But if you're wondering why bits of your motherboard look like Hampton Court Maze, it's likely to be mainly for trace length reasons.



CPU ID

i After reading your magazines I've started to get into tweaking my computer. But I have come across something that I can't seem to figure out. When I originally bought my computer (not brand name crap), it was meant to be a Pentium III 600E (Coppermine), so it should run at 133MHz FSB with a 4.5X multiplier. But when I was going to delve into a bit of overclocking I saw that in the BIOS the CPU is running at 6x100MHz. Since all Intel processors have locked multipliers, this means it's really running at 450MHz. So I changed the settings to 4.5x133MHz, and upon booting up it said it was now running at 800MHz. This would mean that the multiplier is locked at 6X, which means I don't have a 600E. It could either be an original Pentium III at 600MHz or it could be an 800E (Coppermine) Pentium III underclocked to 600MHz. I'm guessing that it would be the former and that I have been ripped off!

Is there any way I can tell exactly what CPU I have?
altan8

o A mere 'P-III 600' is a pre-Coppermine-core P-III. A '600E' is a Coppermine P-III running at 100MHz FSB, which is what you have. A 600EB is a Coppermine running at 133MHz FSB; that's what the B on the end means. So you got what you paid for, unless someone told you that you were getting a 600EB, or otherwise promised you 133MHz FSB.

The real performance difference between the two bus speeds for desktop computer tasks is small enough that it's hardly worth worrying about. Core speed makes a difference but the exact combination of FSB and multiplier you use to get that core speed generally doesn't.

THE IT DIRECTORY

Trying to find a product or service? Look no further. Go to www.atomicmpc.com.au/dealers.asp?mode=1 to find the details of the following resellers, manufacturers and distributors, plus many more. The site lists the Web address, company address, phone, email and fax.

Our Web site will help you to find that elusive product; the ideal reseller, manufacturer or distributor of a particular brand; or simply a product type.

If you know what you are looking for, you can search for the most convenient place to buy it or simply research the options available to you. It's up to you how tight you set the criteria: you can do an advanced search and cross-reference by product, postcode, brand and so on. So quick and simple you'll wonder how you ever did without it!

- 3CO
- Abet Computers
- Access 1
- ACCO Australia
- Acer
- Activision
- A Drive Computers
- AGFA
- Allteq Pty Limited
- Amexcom
- Another World Computer Centre
- Alphazone Computers
- ARC Computers
- Aspen Tech
- ATF Computers
- AusPC Market
- Austin Computers
- Australia Computers Online
- Australia IT
- Australian Computer Recyclers
- Australian Network Solutions
- Autodesk
- AV Computers
- Below Zero
- Best Byte
- Bevdan Business Services
- Bits & Bytes
- BITS Computer Graphics
- Bitstorm
- Brimar Electronics
- Brother International
- Cam1 Computer Wholesale
- Centercom Computers
- CIP Computer Solutions
- Compaq Computer Australia
- Complete Peripheral Services
- CompuEdge Pty Limited
- Computer Cyber Shop
- Computer store @ Newport
- Computer Troubleshooters
- Computer Warehouse
- Computers 4 Less
- Connect U Up Computing
- Connexus Internet
- Cool PC
- Cougar Computers Canberra
- CR Computers
- Creative
- Creative Zone
- Crossys Computers & Electronics
- CW Supplies
- Cyberdec Australia
- Cybertech Consulting
- Cybus Computers
- Cydex Computers
- D Link Australia
- Dell
- Dlife
- DNAML
- Dot Systems
- Duncan Computer Services
- DX Computers
- EBM Computers
- Electronic Product Warehouse
- Emagen
- EPSON
- EYO Technologies
- FNQ Computers
- Focal Point Computing
- Forte Computers Publishers (Aust.) P/L
- Fuji / Hanimex
- Fuji Xerox Australia
- Games Warehouse
- GCC Technology
- Gigaworld Computer Systems
- Go-Xtreme Tek
- Griffler Enterprises
- Guillemot
- Hallmark Computer International
- Hewlett-Packard
- Hitachi Australia
- Hollywood 7 Computers
- HP Paradise
- Impact Systems Technology
- IMSI (Australia)
- In Learning
- Ingram Micro
- INKme
- Inktec Australia
- Innovision Technology Australia
- Integrity Data Systems
- Iomega
- I.T2 The Max
- IT National
- Jack Of All Games
- Jaton Computers
- Jim's PC
- Karana Computer Systems
- Kingston Technology
- KM Computer Systems
- Kodak Digital & Applied Imaging
- LaCie Australia
- Landmark Computers
- Landmark IT Resources
- Lanyon Computers
- Laptop Land
- Leader Computer Systems
- Leading Pacific Australia
- Lemurian Technologies
- Lexmark
- Lidcam Technology
- Mac Troubleshooter
- MacroMax Computers
- MacSense Australia
- Mates Rates Computers Services
- MAUS
- Maxtek International
- Maxwell Optical Industries
- MegaPC
- Microdirect
- Micropaq
- MicroStar International
- Microstructure Computers
- Microtech Corporation
- Mindflux
- Mitsubishi
- Mobile PC Workshop
- Modtech
- Multimedia Technology
- Navada Computer Services
- NETGEAR
- NetPlus Micro Computers
- newcomputers.com.au Box Hill
- newcomputers.com.au Oakleigh
- NoLimitz Computers
- Nortec Computers
- Notebook Solutions
- OA-Link
- Ocean Office Automation
- OKI
- One Group Computers
- Online Marketing
- Organiser World
- Overclockerz Supplies
- Oztec Computer
- Palmwoods Computers
- Panasonic
- Parramatta Computers
- PAW Products
- PC Case Gear
- PC Case Mods
- PC Cooling Australia
- PC Repair Centre
- pcXtra Computers
- Peakhour
- Performance, Memory and Peripherals
- Perpetua
- Philips
- PICA Software
- Pioneer Computers
- Point Computer Systems
- Proven Technologies
- Pullman Computing
- Punch Technology
- Purpose Built Computers
- QD Innovative Computer
- Questek Components
- R.Gunz (Photographic)
- Rectron Electronics
- Ricoh Australia
- RTV Computer
- Sage Distribution
- Samsung
- Santacom Computers
- Sanyo
- Sato Enterprises
- Scorpion Technology
- Shane's Micros
- Sharp
- Short and Tall Computing Services
- Silicon Memory Technologies
- Sony
- Speedcom
- Surplus Computer Products
- Symantec
- TeamLink Australia
- Tech Pacific
- The Cartridge Man
- THX – The SONY I.T Store (Parramatta)
- Toowoomba Computerland
- Toshiba
- Trinix Computers
- Tweak Town Shop
- VideoBytes
- Viewsonic Australia
- WB Gamezone
- Western Computer Networks
- XClusive Software
- Xenon Systems
- Yamaha Music

Where should I stick this?

A quick question regarding a Macpower DigitalDoc5 and its sensors. I recently bought a whole new PC and I am planning where to put the thermal sensors from the Digidoc5 for temperature monitoring. The manual specifically says not to put the flat thermal sensor between the processor plate and the heatsink because it interferes with the transfer of heat from one to the other, even though it is the best place for monitoring the temperature of the CPU.

What is your opinion on this? Is Macpower just being over-cautious by saying it interferes with the heat transfer?

Chris Kerin

This sensor is fat. Really fat.

Macpower is right to tell you not to put anything but a thin layer of thermal transfer compound between your CPU and its heat sink. The shiny raised contact patch area in the middle of your processor – which is the part that actually touches the heat sink metal, and through which the CPU gets rid of practically all of its heat – is very flat. The bottom of your heat sink should be flat too, with any luck. If it's not, a quick bout of lapping should get your HSF nice and flat. You're not bolting a slab of cast iron onto the side of a pot-bellied stove. The tolerances in CPU-to-cooler mating are very small, and it doesn't take much to introduce an unacceptable gap.

Flat thermal sensors are less than half a millimetre thick at the actual sensor point, and considerably thinner elsewhere, but that's still more than enough to seriously compromise the thermal contact between the CPU and the heat sink. Sure, you can fill the whole area up with thermal grease, but thermal grease isn't anything like as good at moving heat as direct contact. It's just a lot better than air. The purpose of the grease is to fill the air gaps, but those gaps should be microscopic.

If you did happen to place the sensor directly over the top of the CPU, you run the very real risk of frying your CPU into silicon heaven. It might not happen as soon as you boot up, but leave it running for a few minutes and you'll see the temps on your shiny new DigiDoc soaring to stratospheric levels.

So instead of mounting it directly over the CPU core, place it slightly off to one side of the core. Because of the height of the core over its packaging, you should have plenty of headroom. Try to get the end of the sensor to press up against one edge of the CPU core. This way you should get fairly accurate CPU temps without frying it.

DVD-R = CD-R?!

I have seen several banners and advertisements regarding the copying of DVDs on standard CD writers.

I find this VERY hard to believe, but I'm curious whether this can be done. Considering the very high prices of DVD-R drives, simply burning DVDs on a CD-R seems too good to be true!

Am I right, or am I just in denial of a technological breakthrough?

Pujitha Fernando

Unsolicited commercial email. Is there anything it can't do?

These spamming scum-suckers aren't talking about burning DVDs. They're spammers – so they're lying thieving pig-licking toilet blockages with feet – but even if they were honest, they'd just be talking about ripping DVDs to one or another video CD format.

This is not a very big deal – take your DVD video stream (which is easy enough to access, since the encryption used on DVDs is famously craptacular), re-encode it with a lower bandwidth codec (see www.divx.com, for instance) so it'll fit on a CD, write the result to the CD, done.

Recompressed DVDs can look surprisingly good considering their greatly reduced data rate, but they can't ever look as good as the original video, and they won't be a DVD either. If you convert DVD video to MPEG-1 and burn it to CD in Video CD ('White Book' format) then it'll be playable in any DVD player that works with CD-Rs and can play VCDs – but you'll need a couple of CDs per DVD. If you just convert DVD video to a big fat DivX:) AVI file on a plain data CD-R ('Orange Book Part II' format), though, no normal DVD player will understand it.

Oh, by the way, if any spammers are reading this – your continuing campaign to ask me at least once a day if I want to see weird people having even weirder sex has not (yet) created in me any desire to see any of these things. Not to worry, though, I'm sure you'll stick with it.

Send your questions to I/O@atomicmpc.com.au or by post to: I/O AtomicPO Box 275 Beaconsfield NSW 2014

i Unresourceful PC

I use a lot of fairly hefty applications simultaneously while doing Web design work. It is becoming increasingly frustrating having to close important programs or restart Windows because I very soon become flat out of system resources – as reported by SiSoft Sandra, included on your issue 11 cover CD.

I would expect that the programs I am using (products by Adobe, Macromedia, etc) would not be leaking resources to any significant extent.

I almost always have a great deal of my 512MB of RAM free. If it is not a memory related problem (at least in regards to the amount installed) what exactly are 'system resources' and how can I upgrade/tweak my system to prevent this from happening? I am running a Duron 800.
James Cowling

o You don't specify what flavour of Windows you are using, but my infallible psychic abilities are telling me that it's something from the Windows 95 series. That includes Win98, Win98SE, and WinMe.

All of these OSes are carrying large and unseemly piles of baggage from the distant past, and 'System Resources' is one of the larger suitcases.

It doesn't matter how much physical RAM you have in your machine. System Resources are different: they're little areas of memory used by Windows for housekeeping tasks, like drawing things on screen, remembering what windows are open, and so on.

One of the ways in which Windows 95 was a Great Leap Forward from Windows 3.11 was that it greatly increased the System Resources limits, but they're still quite limited, and power users can slap into those limits easily. Some programs need only a small share of various Resources, but other popular apps can slurp up huge chunks, comparatively speaking.

When your aggregate free System Resources amount drops below about 15%, life starts to get a little weird. Many applications, including big expensive commercial ones, 'leak' System Resources: they don't release them when they're finished with them, even if you quit the application. The only solution, short of adapting Groucho's medical advice and just not running that application, is to reboot a lot. Or, of course, you can give your Win95-series OS the flick, and switch to an NT-series Windows version – Win2000 or WinXP. Neither of these Windows flavours has any System Resources limits.

Crappy resource-leaking software survives for this reason: if most of the users of a given heavyweight app are running an NT-series Windows version, they won't care about the software's brain damage.

i 4in1 for XP?

Does Windows XP, when you install it, automatically install VIA 4in1 drivers for motherboards that need them? I asked a computer support person at a local store and he seemed to think XP did it all – but he was very unconvincing.
Mark Woods

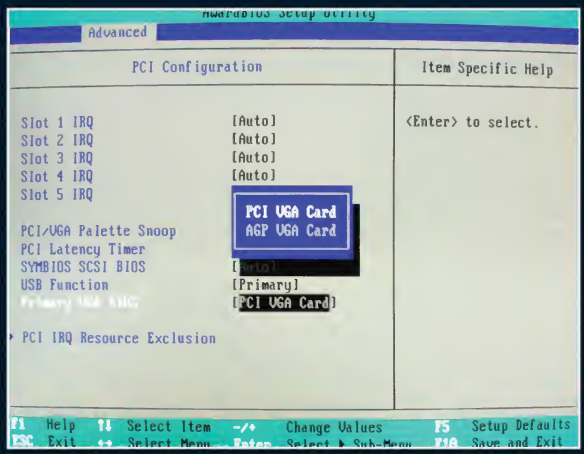
o VIA's regularly updated motherboard driver installer (you can download the latest version from www.viaarena.com/?PageID=2) has been quite a well-behaved little critter lately. It installs what's needed, and doesn't install what isn't, on any VIA chipset motherboard.

When Windows XP first came out, it did indeed have built-in drivers for VIA-chipset motherboards that were as good as anything the 4in1 installer of the time could give you. Which was a nice change. Every Windows flavour before WinXP needs the 4in1 drivers to be installed after the OS, or you'll be putting up with strangely slow performance from basic compatibility-mode drivers.

i Poor choice

I have a Pentium III 1GHz with a GeForce2 MX graphics card in the AGP slot. I decided to add a secondary video adaptor and monitor – a PCI S3 Trio64 card and an old 15" monitor. I hooked it all up but when I turned the computer on I found to my dismay that Windows 98 decided the crappy PCI slot card should be the default adaptor. This is obviously not what I wanted. I first looked to the control panel, but this gave no answers, even after clicking every option and waiting for the computer to restart.

I installed the cards in a different order: the PCI card first, and then the AGP card. Again this did absolutely nothing and the Trio64 was still the primary adaptor. Does this happen because the adaptors are incompatible?
David Williams



ⓘ Many motherboards let you pick whether to make AGP or PCI the primary adaptor

o It's not Windows' fault. It's the BIOS. You'll need to go into the BIOS setup (by pressing Delete on startup, probably, unless you've got a brand-name machine that insists on doing it some other way) and look for a 'Primary VGA BIOS' or 'Video Initialisation Order' sort of option.

Switch it from the default 'PCI' to 'AGP' and you're in business.

If there's no such option available in your setup, then it's possible that a BIOS update will help, but it's probable that it won't.

There are various BIOSes that don't allow this option to be changed, and are stuck on PCI-first.

If that's the case, then to fix it you can get a new motherboard, or get a better PCI graphics card, or (more elegantly) get a dual-output graphics card, like a TwinView GeForce2 MX. o

Send your questions to I/O@atomicmpc.com.au or by post to: I/O AtomicPO Box 275 Beaconsfield NSW 2014

Tweaking RAM speed

You've chosen the best quality RAM to get your system sprinting, but it could go faster. What next, tweaker? Simon Peppercorn will help you avoid memory loss.

Disclaimer (kind of): I don't actually recommend you perform any of the tweaks described below. Just like overclocking, if you aren't sure of what you're doing, then don't do it. And especially don't tell anyone if you bust something, because they'll probably laugh at you. If, however, you perform these tweaks and the results are spectacular, then tell everyone and bask in the warm glow of their admiration.

I'm not going to tell you about tweaking Windows to manage your memory any better than it already doesn't. Instead, I'll tweak the system itself to access your memory quicker and more efficiently. No matter how fast your RAM is, every process takes time, and as it has to perform millions of these actions over and over, any opportunity to speed up or streamline any part of each process should be given consideration.

Ideally it should only take one clock cycle for the CPU to address a bank of memory and for that bank to prepare itself for the next address. However, due to the latency (which I'll get to later), other processes taking place, or a backlog of requests from the CPU, a number of clock cycles may take place before the CPU request process is completed.

It is very easy for even the fastest RAM to become a bottleneck for your overall system performance.

Interleaving 101

Along with storing all your frequently used 1s and 0s for quick and easy access to the CPU, one of the processes that a DRAM module performs is refreshing, or recharging, the memory cells. These memory cells are built from tiny capacitors, which hold an itty bitty electrical charge. The very act of retrieving data from the memory array drains this charge, and if the cell wasn't recharged, or refreshed, then it would lose the data. This is why we say that RAM is volatile. Remove the current and your data goes down the toilet.

A typical SDRAM module is divided into two separate banks: 2-way memory interleaving allows the CPU to address a second bank of memory while the first one is resetting, or refreshing, effectively creating a continuous flow of data between the CPU and your RAM. This significantly reduces the length of the memory cycle and can provide considerable increases in transfer rates. This process can extend to four memory banks, rather obviously called 4-way memory interleaving. This is not the same as pipelining, where a process is split into multiple components overlapped for faster execution.

One of the failings of many VIA chipsets is that, until recently, their ability to handle memory interleaving – if at all – was poor. In fact, in terms of this area of memory usage, it has been documented that the earlier BX chipsets out-performed the newer VIA ones. More recent motherboards, such as the ASUS A7V266-E, support 4-way memory interleaving from the BIOS. For those not fortunate enough to have these options, such as the VIA Apollo Pro, the Apollo Pro A or the KT133 chipsets, you may still be able to use two small programs, WPCREDIT, WPCRSET, all available at www.viahardware.com.

The use of these proggies allows you to manually enable memory interleaving by directly editing the memory registers with a hex editor. It's powerful, but not intuitive. There is a newer program also available from www.viahardware.com called George's Memory Interleave Enabler, which works with a wider range of VIA chipsets. The tweaks are performed automatically, which despite offering a simpler solution, may or may not allow the level of control you desire. Be warned: follow the instructions at the site very carefully. Bugger it up and you could damage stuff. Do it right and you will be rewarded.

Using a motherboard which supports memory interleaving from the BIOS, an A7V266-E, and using two 256MB modules of Infineon DDR-SDRAM, we did some testing to see what could be achieved.

Setting all the memory settings to default to provide a base line, SiSoft Sandra proudly informed me that my memory bandwidth was ALU: 505MB/s and FPU: 541MB/s. Nice start.

By enabling 2-way interleaving, these scores jumped to ALU: 631MB/s and FPU: 742MB/s. Knowing darn well these numbers could be so much better, I went back to the BIOS and cranked it up to 4-way interleaving. Now showing results of ALU: 684MB/s and FPU: 831MB/s this represented something like a 35% increase in ALU bandwidth, and a 53% increase in FPU bandwidth. Brilliant.

Don't stop 'til you get enough

Memory interleaving is just one of the many things you can do to boost your memory grunt.

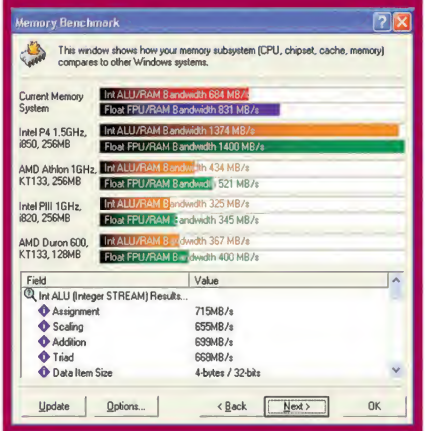
Latency can be defined as the elapsed time between a stimulus and the response to that stimulus. This is what is meant by the RAS (Row Address Strobe) to CAS (Column Address Strobe) delay. You need to picture your memory as if it were laid out in columns and rows in a grid type pattern. Each cell on the grid represents a memory address and requests for data occur in strobes or pulses.

CAS to RAS latency refers to the delay, or the number of clock cycles it takes to reach the correct address. When a particular address is selected, your chipset first looks across the row for the RAS address. It then takes 2-3 cycles for the chipset to find the column (CAS) address, and activate. This is CAS latency. Basically a CAS latency factor of 3 means a 3 clock cycle delay. Many newer RAM modules can comfortably run at CAS 2, or a 2 clock cycle delay, even though they may be rated as CAS 3. However, RAM modules rated as CAS 2 can be overclocked with more success.

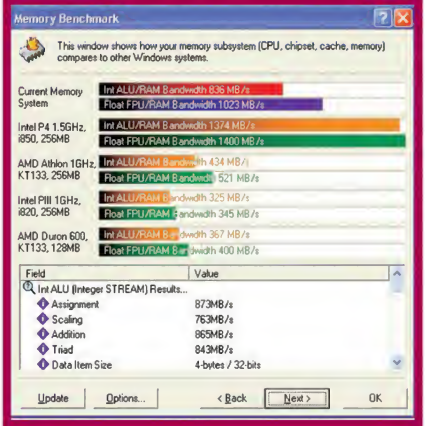
Hopefully your BIOS will allow you to adjust these settings. If you are going to mess around with memory timings, then do it one step at a time, testing for stability as you go. If you make a change, write it down, so if it goes bad, you can revert to the old settings. Not all of the suggestions here may appear in your BIOS, or the descriptions may vary a little. Take a look.

Reducing the CAS latency will give you a reasonable performance boost, but you should do this one last, as it can also present the most problems. Try your RAS precharge time first, and lower it to 2.

ABOVE: Baseline score, default settings



ABOVE: I'll take that 35% increase thank you



ABOVE: Up and up

Reboot and test. Works? Good! Now move to RAS to CAS delay and nudge it down to 2 as well. Reboot and test. Finally, if all is well, give that CAS latency a push down. If it fails this time and the BSOD starts to give you heartburn, just flick it back up to 3 again.

Some BIOSes don't give you this level of control. Your BIOS may represent these settings as a single adjustment, showing values such as 3-3-3 or 2-3-2, with the option to toggle between combinations of these. The lower numbers you can run stable the better.

By the time I had finished messing around with these settings, I had a memory benchmark of ALU: 836MB/s and FPU: 1023. I was now looking at around a 60% increase in the ALU and a 90% increase in the FPU. Lordy lordy!

The Blue Zone is for tweaking

Some BIOSes have some of the following settings. This is how they should be set for optimal performance:

Read Around Write: Data can only be transmitted in one direction at a time. A command to write will interrupt any read operation that may be taking place, causing delays for read memory traffic. As the amount of write traffic is very small by comparison to the read data, by enabling Read Around Write, the memory controller sets up a kind of cache and writes to memory in batches, or bursts. Reading from this buffer is more efficient and less taxing on your RAM.

SDRAM Precharge Control: By enabling this setting, you instruct all banks of your memory to precharge, and not just the active ones. This should provide an improvement in the performance of your RAM, but could prove troublesome if other parts of your system aren't running at their standard bus speed.

SDRAM Precharge Time: Sets the amount of clock cycles before the chipset assumes enough charge has accumulated prior to refreshing the data. This can speed up performance but if the recharge is incomplete then data loss can occur.

SDRAM Speculative Read: When the controller receives a read request from the CPU, the controller allows the read command to commence before it has even finished decoding the data address. This speeds up the entire read process if the setting is enabled.

Some motherboards, such as the Gigabyte GA-7ZM, may not have great overclocking features, but they often present terrific memory tweaking capabilities, such as the capacity to nudge the voltage going to the DIMM sockets in milliamps. As many of you would know from CPU overclocking, the ability to increase voltage settings is critical. See www.bxboards.com/pc133/pc133-voltage.shtml for detail on memory voltage.

You will see the benefit of these tweaks only when you start counting those FPSes, or comparing your 3DMark scores, when 3D applications are churning away. This is because video memory isn't cached, so the majority of your data spends its time bouncing around between your AGP, CPU and system memory, where bandwidth is critical. I squeezed 122 points out of 3DMark2001.

When purchasing RAM make sure it is good quality and rated at CAS 2. If you are doing the upgrade thing, and want to mix your older CAS 3 modules with CAS 2, then that's fine, but set all your timings to 3-3-3

A final word, as I mentioned earlier, not all these tweaks will work for all RAM types, and/or all chipsets. You won't know until you try. With RAM so cheap, go for something decent. You will find that some of the poorer quality RAM modules are not likely to be too happy being pushed to these sorts of limits, and may exhibit all kinds of wacky behaviour, such as freezes, failure to boot or dressing up as Daniel Rutter.

Improve yo memory

- Download WPCREDIT, WPCRSET for editing memory registers, from VIA Hardware: www.viahardware.com
- Info on memory voltage adjustments: www.bxboards.com/pc133/pc133-voltage.shtml

PDA Hacking

PDAs are dull. But do they have to be? Armed with a powerful imagination, the right software and some cheap-arse screwdrivers, Alex Kidman investigates the little computer that could. Maybe.

Why take a perfectly good PDA apart? It's not as though PDA manufacturers go for overclockable motherboards or removable graphics card options, so there's little you can actually safely alter. You've got less room to move in one of these things than you would in a standard notebook.

If you're particularly into soldering, you could take out the memory and put more in, although the reliability of such an approach varies from machine to machine. As most PDAs use memory primarily for storage rather than running software more quickly, it'd be much easier to just dump a 64MB-2GB card in the CF slot. It won't be as fast as onboard memory, but it's much, much simpler.

There is still one other reason (besides the mountaineering defence: 'because it was there') to pull your PDA apart, and it only applies if: a) you're in a grubby environment; and/or b) you've owned it for a while. Opening up your PDA is a great excuse to clean it out with a dab of compressed air: just the thing for removing dead skin, dust and that Coke spill you didn't tell anyone about. There was an issue with early iPAQs getting dust in between the screen layers, which could be solved with the judicious application of a length of hair brushed in between the layers. The lesson here is clear: anything can be a tech tool, even a curly pube.

From Jornada to Junknada, and back again

Here we have an innocent looking HP Jornada 565. Innocent – but not for long.

Before getting stuck into any PDA, back up everything, twice. In the case of the Jornada it isn't strictly necessary to remove the backup battery, so your data should be safe; but it's still worth doing, and plenty of other PDAs will not come apart until all the power (and with it the data) has been killed.

Remove all the torx screws first. The first two are easy enough because they're on the back; remove the Compact Flash holder and backing, and there's the third. Now take the back sled off and you'll find the last two torxes at the base – with the ever-ominous 'warranty void if broken sticker' covering the right hand one. The sticker will probably gum up the right hand screw when you try to remove it, but unscrew it enough and it'll fall out once the back is off. The back isn't mere easily replaceable plastic: it's a thin Li-Ion battery. So there.

The rest of the removal involves simple flathead screws, albeit jeweller's sized ones. Any decent jeweller's screwdriver set (or even the crappy $2 set I used) should be sufficient. Remove the screw nearest the battery contact point and the back should come off, revealing the rest of the PDA. The internal layout is impressive from a 'we don't want to have to pay money for screws' perspective, as two small screws and the exterior button rubber is enough to hold the whole unit together from this point. The rubber outside casing is just held in place by a ton of rubber latches, which will easily strip back with a small screwdriver head or even a pin. Once the rubber is off, the front cover can also be easily removed by popping in the tabs holding it in place.

Now you have access to the front: you'll see a small screw holding the circuit board that runs all the face buttons; removing it makes taking the screen out much easier (just be careful not to frag the ribbon cables in the process).

Next, you can carefully remove the screen by pushing in the clips on the side with a small screwdriver to find the processor and memory tucked in behind. If you're feeling particularly brave, you can remove the screen entirely by disconnecting its ribbon cables, but this is the dodgiest step of the lot. One bad ribbon removal or reinsertion, and it's game over.

The screen itself makes up most of the unit. While it has some interesting technology under the hood, a touchscreen will instantly become a deadscreen if you don't respect its fussiness about being handled extremely carefully. An LCD touchscreen is made of four or five individual components to register onscreen touching. Unlike most touchscreen monitors that have a small current constantly running under them, and register touches as interruptions, resistive LCDs simply measure the touch without the constant current, which is important when you're trying to save as much power as possible.

The touch is converted into a current gradient that tells the screen not only where the press is, but how long it's held for. That information can then be passed to software to distinguish between a selection tap and a menu tap, for instance.

The majority of the buttons are all simple rubber contacts. This does have implications for self-repair, as long as the unit's already out of warranty – which it is if you've broken the label seal anyway. If the buttons stop working, check out the contacts, as it's often a case of a surface layer of worn rubber reducing their effectiveness.

A quick clean will quite often have you up and running again.

Inside the Jornada you'll find:

- 'Maxim' – a low capacity analog switch which will set you back $US0.99 each in quantities of 1000 (what you'd do with a thousand Maxims is your business although it's unlikely HP has paid anywhere near that unit price);
- A 206MHz StrongARM processor – it's not specifically upgradeable, but possibly overclockable. All the Pocket PC PDAs released so far have one of these little numbers hiding somewhere inside; and
- Two banks of Samsung memory – according to HP's documentation, the memory runs on a 103MHz bus (not 100MHz, or 133MHz, but a precise 103MHz).

Now, about that memory: based on the printed codes it's running Samsung Memory K4S281632C-TC/L75 which supports bus speeds up to 133MHz. What that extra 3MHz does for the PDA is anybody's guess, but the funky thing is that the Intel 1110 StrongARM processor – which this unit clearly has – only supports a 100MHz bus speed according to Intel's specifications. Does this say something about HP's stopwatch?

Case modifications

While newer PDAs are nowhere near as ugly as their closest ancestors, they're still a pretty dull bunch. The common recipe for a PDA is simple:

1) Take one LCD screen.
2) Wrap it in either black or silver plastic. Add buttons to taste.
3) Bake until bored.

Just because it's made that way doesn't mean it has to stay that way. Your range of modifications is somewhat limited by how much plastic you're willing to mould, but taking apart a PDA isn't all that tricky, and having done that it's simply a matter of working out your dimensions and moulding something suitable. Bear in mind that any modification that calls for a power supply, such as LEDs, will be hard to integrate into the unit itself because there isn't a bunch of spare power connectors floating around inside, so it could drastically affect overall battery life. But I'm sure you'll sort something out if you want to put an array of LEDs on the back of your unit to make your hand glow an ET-friendly, or demonic looking, red colour.

Some vendors make case modifications easier than others, but a little trimming, painting and warping will go a long way even with a basic silver PDA, while units with clamshell covers are gagging for a solid session of painting and moulding.

Slipcases offer more creative opportunities. While a quick Web search will reveal a trove of DIY case plans from people who spend more time reading *Practical Needlework Magazine* than *Atomic*, the real advantage with a homebrew case is that it won't affect the PDA itself.

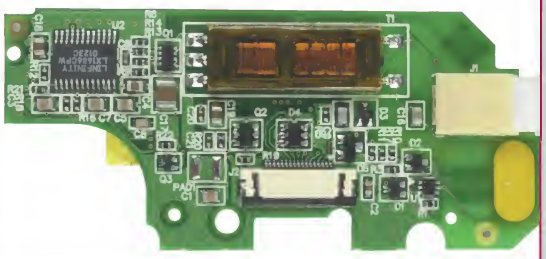
Overclock, underclock, wombling free

Unless you're really, really keen *and* have access to the design specs of your chosen PDA, you can rule out physical overclocking. The good news for Palm and iPAQ owners is that there are software utilities that will ramp up your CPU speed, and while you're never going to see these little numbers truly smoke, every little bit helps.

The fine art of underclocking

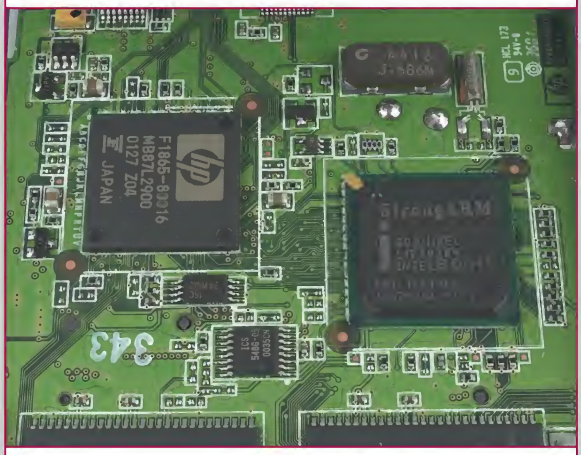
Yup, you read that right, underclocking. You're probably thinking: 'hang on, have I inadvertently picked up *Weak Brownian Forces magazine*?', but trust me, there is indeed method to my seeming madness. By taste and Microsoft decree, the current top of the range PDAs only carry a 206MHz Intel StrongARM processor, which with the right software can be punched up another 30MHz or so – hardly earth shattering stuff for your performance dollar. Likewise, you can easily drop around the same 30MHz.

The big achievement of underclocking is a drop in the amount of power that the processor requires. It's this exact trick that Intel uses with its Speedstep mobile processors: drop the frequency and drop the power requirements. PDAs chew



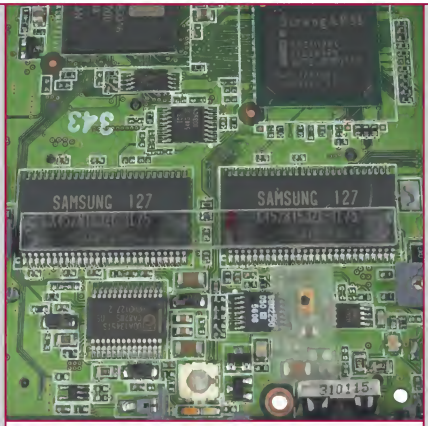
ABOVE: The circuit board that manages the Jornada's controls is pretty clearly laid out for something that's not meant to be upgraded. Hmmmm...

ABOVE: HP sells additional batteries, but the core info you'd need to power a Jornada is all supplied here – as long as you could get the right kind of battery connections.



ABOVE: "Look Maw! It's one of them purty processor thingies. Where'd I put all my solderin' irons?"

ABOVE: HP Jornada 565 goes the full monty. From here, its circuits laid bare, you can feel the sweat dripping off your brow. Make no mistake - it does want you.



ABOVE: Getting inside the Jornada may be a touch complicated, but you can hardly accuse HP of complex circuit design.

through power at a rate that would make most mobile phones blush with embarrassment, so saving power means more run time for whatever it is you do with your PDA.

As with most overclocking attempts, the results vary according to your usage model. If your PDA is a hardcore MP3 listening, video playing device, the drop in performance will be quite noticeable. If on the other hand it's a glorified diary, you won't see the performance drop all that much, but at least you won't have to recharge it so often. Of course, if you're using a Palm, you're already talking battery life in weeks, so the underclocking argument has much less steam.

IPAQ Overclocking
www.jimmysoftware.com/Software/Overclock
Palm Overclocking
www.geek.com/hwswrev/palmpilot/afterburner

Really tiny gibs

The other reason most Atomicans probably haven't thought much of PDAs is that the gaming options suck. We mean really suck. Diary and organisational stuff might be handy, but we want to shred polygonal beings into tiny bits, dammit!

Well, you can. Quake has been available for the Pocket PC for some time thanks to the work of Dan East, and at the time of writing a very early beta of Quake 2 was also available for download.

Sure, Quake is pretty old, but it's a step up from Doom, which is practically all that's currently available for any other portable platform. And it's free.

The Pocket PC Quake uses original .PAK files, so you can use maps if you like, but the controls add an entirely new spin to the difficulty. Moving around and strafing is easy but fast, precise aiming isn't. Depending on your PDA model, you may have to click the movement button to fire, which tends to slow things down a bit, and in Quake, slow equals dead. If you're truly obsessed, you could always pop for a portable keyboard to aid you.

PDA Quake also has some truly nifty modifications, the best of which is the option to set the resolution to landscape mode. You do end up with the controls at one end, and people will look at you oddly if you do it in public, but it makes the entire visual experience that much clearer.

Despite knowing the initial map very well (anyone who doesn't can go sit in the corner now) death was awaiting me with big pointy teeth. Getting through even the first couple of levels was a definite challenge, especially when the time came to swim. Think of it as playing Quake with the main character pumped full of Valium tottering around on a zimmer frame.
www.pocketmatrix.com/pocketquake

Window washing

Shockingly, Pocket PC 2002 is actually a good Windows operating system. It works, it's mostly stable and it does everything you'd need out of a PDA OS. Admittedly, so does Palm OS, but it's unusual to see a non-XP version of Windows that doesn't suck in some way.

Just because it ships with Pocket PC 2002 doesn't mean you have to stick with it. In order to make PDAs theoretically upgradeable, they use Flash ROM, and Flash ROM can be upgraded with much more than simple service packs.

If Linux is your thing, and we're sure there are at least a couple of you judging by the great feedback we got regarding Ashton's Linux and games piece, there are a couple of flavours available, mostly compatible with Compaq's iPAQ range. Why iPAQ? It's partly due to its pre-eminence in the Pocket PC field, but also to Compaq's interest in handheld Linux, which includes supporting the handhelds.org site (a central repository for PDA Linux). As with most things Linux, it's not exactly a simple step to install, and PDA Linux is still particularly early in its lifecycle. At the time of writing, the installation process had only just moved over to using USB; prior to that your only option was a slow, slow, slow serial install.

There are some definite advantages to running Linux on your PDA. While you can't really claim moral superiority, because Uncle Bill still has your money for the initial Pocket PC 2002 installation, you can escape his clutches by running any ARM-compiled Linux application on your PDA, which means your PDA moves away from simple PDA applications and be more like a very expensive little

Freetail

And you thought Atomic had given away all its free stuff. Boy, were you wrong. Just to prove it, we've got another bucket load of free gear to throw your way this month. Who says Atomic doesn't try to lure new readers into our cosy sub-reality with wads of expensive kit? It's amazing that we get so many cool prizes to give to you people, but we're not about to start complaining. And neither should you. Or you won't get it any more. Now go and eat your brussel sprouts.

This month we haven't got one competition for you. Oh no, this month we've got a massive four competitions to raise your chances of winning higher than ever before! If that doesn't prompt you to tell all your friends/family/captives in the little dungeon you dug out with a spoon about Atomic, then nothing will...

Office XP Pro

Now that you've built a new system out of free stuff that you won from Atomic's competition page, you're going to need some hot new software to push it to its limits. What better than a copy of Microsoft's Office XP Pro? OK, five copies is better, so here you go. Shout outs to Microsoft's people for being such a giving bunch. Of course, there is a question that you'll need to answer to win a copy, and that question is:

Q: In which television program did the characters Zebedee and Dougal appear?

GTA

Now that this now lovely game has been modified so that it won't turn you into a rampant prostitution addict, you know you want some. Yes? Yes! GTA3 is a realistic urban traffic simulator, allowing learner drivers to experience the responsibility that comes with controlling a vehicular vehicle amidst a throng of pedestrians – who must remain in complete road safety at all times.

Thanks to our great mate Dave at Take 2 Interactive, we've got four copies of the traffic sim to give away, plus an item of drivers' protective headgear as a safety bonus.

Q: How many GTR XU1s were produced?

ASUA V7700 Ti Deluxe GeForce2 Ti

Is your crusty old NVIDIA Vanta starting to whimper under the strain of the new Q3-engined game you just installed? Then it's time to upgrade! Thanks to the generosity of those fine folk at ASUS (www.asustech.com), we've got a sparkling new GeForce2 Titanium to halt those hardware blues.

Q: What was the name of the first dedicated gaming console ever produced?

MSI SiS645 Motherboard

You want to go the whole hog and upgrade your entire system? You'll obviously be needing a new motherboard to plug all those sexy new devices into then, won't you. The SiS645 chipset is no slouch when it comes to punching out the polygons, so you can rest assured that this mobo will keep you happy. The sixty four thousand dollar question for this piece of kit, which was kindly donated by the ever generous MSI (www.msicomputer.com.au):

Q: Which movie did the former keyboardist for The Animals write a soundtrack for, and what was this talented dude's name?

Email entries to win@atomicmpc.com.au or post them to: Atomic, Competition Name, PO Box 275, Beaconsfield NSW 2014. The closing date for entries is 20 March 2002. Winners will be announced in Atomic 16.

Atomic 12 winners: Civilization II: Q. Who was the great trading race of the Mediterranean? A. Phoenicians B. Hor Leong, Bulleen VIC; C. Milne, Rosanna VIC; J. McGraw, North Mackay QLD; J Ingleton, Sandy Bay TAS; M Jepson, Eden Terrace NZ; B Paine, Christchurch NZ. TDK Tremor S150 speaker system: Q. What's the proper name for a sound-absorbing chamber? A. Anechoic Chamber. A Freeman, Herne Hill VIC. Logitech MouseMan Dual Optical: Q. What's the name of the type of opera singer who's been surgically modified down there? A. Castrato. I. Simic, Wilston QLD; W. Lau, Baulkham Hills NSW. IL2 Sturmovik + Thrustmaster: Q. How many variants of the BF 109 were there? A. 91.

The Talking Page

In the future, we will communicate via neural implant NICs connected by optic fibres running out of our noses. Until then, the Atomic letters page will have to suffice. LOTM and POTM each win a delightful Logitech Dual Optical mouse, which is used by celebrity gamer Potatocake.

LOTM: RC

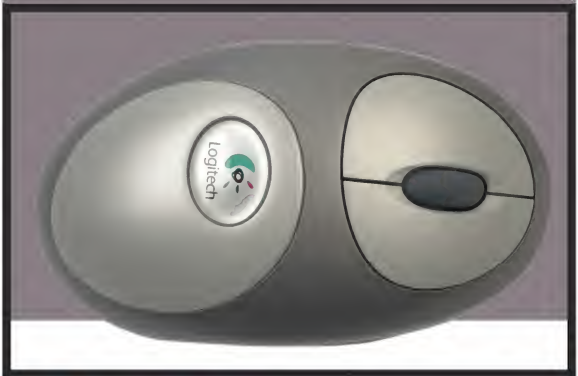
In your Grand Theft Auto 3 review, I'd like to point out that the correct usage is not 'bad-arse', it's 'bad-ass'. 'Arse' is British, 'Ass' is American. It's the Yanks who use the phrase, not the Brits, hence 'bad-ass'.

And in the World War III: Black Gold review, you may or may not be interested to know that Saddam Hussein has no suicide bombers or religious fanatics on his side. None. To say that Iraq is an Islamic state is like saying that the US is a Christian state. Saddam is an entirely secular ruler, and Islamic fundamentalism is as much a threat to him as it is to George W Bush.

Or to put it another way, it is the conduct of leaders like Saddam Hussein that is turning so many Arabs to seek solace in religious fundamentalism. Lawrence D'Oliveiro

In a word: Smartarse (UK)!, Dumbass (US)!, Take your pick.

The smart way to spell arse is 'A.R.S.E.' as it's the original (UK English) spelling from which the US version was derived. And... apparently the word ARSE derived dyslexically from EARS (go figure). Whenever possible, we go for the UK English spelling over the overly simplified (and often phonetic) American spelling. We'd also like to point out that the term 'Yanks' – the short form of 'Yankees' – strictly speaking refers to the good folk of the northern states of the USofA, not the entire continent. And it derived from the Dutch nickname 'Jan Kees' (John Cheese), which we're sure is some kind of reference to poor personal hygiene, namely, smegma.



POTM: Come to bed...

A lot of ground was covered during the month of January, on our festive and happening forums. We dissected time travel, we LANned, we worshipped Lord Bevan, we communicated in Morse code.

In the presence of such intellectual magnificence, we are, however, compelled to award POTM to a rare and special kind of Atomic post. The magic of this post is that it humanised our forums in a very unique way.

Woot to Mrs Texxas! We dig your funky style!

www.atomicmpc.com.au/forum.asp?cat=ge&top=27137

Ping a ling

In reply to Matt Dwyer's letter from issue 12: A lot of Australian domestic users are on pair gain systems. Yes, Telstra will continue to install them, as they are a cost effective way of providing phone lines. No, a lot of them are not high-speed data capable. Deal with it.

Standard domestic phone lines are built for voice transmission, data speed over them is pot luck. If you want a guaranteed high-speed data service, then you'll have to pay a lot more than standard line rental for it.

You could try contracting Telstra and asking what sort of PGS you are on. If you are on a Remote Integrated Multiplexer, enquire if there is a spare 2B1Q channel available; this would at least give you access to an ISDN NT1 line. If there isn't, or you're on a PGS other than a RIM, either forget it or ask about access to normal ADSL service.

Blaming Telstra – or your ISP – for a high ping time is placing the blame in the wrong place. To actually determine how much of the ping time is determined by the local loop and interexchange network, you need to do a tracert check, then ping the first IP that comes up – i.e. your ISP's modem. Typical ping times for this leg are under 120ms even for a V.34 connection. I just tried mine, it pings at 105ms to my ISP (at 28800bps/V.34), and to Atomic's server at a respectable 197ms.

If your route trace shows the ping to the far-end server goes via Vladivostok, Prague and Bogota, there's nothing that Telstra or your ISP can do as they have no control once the packet stream leaves the IEN. And the nature of the Net means there's no guarantee the packet stream will follow the most efficient, or even consistent pathway.

The upshot of this is that even the slowest domestic connection is likely not the primary problem with high ping times – my ping is lower than yours, despite a comparable upload speed and vastly slower download speed.

The vast majority of the problem lies with congested routers and servers. If your ping is 1500ms and the local loop/IEN components (about 120ms x 2) was completely eliminated, the result would still be 1260ms!

Feeling better now? I didn't think so. On the other hand, if your ISP's servers are overloaded and that's what is slowing your ping times, then it might well be a good time to find another ISP with a better users/machine ratio.

Scott Pankhurst

The big picture

In issue ten, Bennett Ring said that he won't even try a game if it doesn't support at least 1024x768. That's ridiculous! The only programs I run that high are Fractint (to get nice sharp fractals) and the Windoze desktop. But even though most of my Windows games support 1024x768, I don't run any of them higher than 800x600.

It's not that my PIII 500 can't handle 1024x768, as most areas are playable at that high resolution. In my opinion, Increasing the resolution above 800x600 doesn't produce any really noticeable improvement in image quality for games. If I want great graphics, I'll turn on the fancy options, even if it means running at 640x480 for a reasonable speed.

Bennett mentions that most sprite-based games don't support resolutions that high, and there is a good reason for that: it exposes too much of the level, giving you a bit of an unfair advantage. He also asks: 'Have you seen how awful 800x600 looks on a 19in monitor?' Er, no. Come to think of it, I've never even *seen* a 19in monitor.

Good graphics is about features, not resolution. You can have great graphics at 320x200 (such as the demo Second Reality, made back in 1993), and lousy graphics at 1024x768 (a good example being Quake 2's software renderer).

RoXoR

We should not forget that not everyone has a 1GHz+ machine. We should also remember that it's the enjoyment one derives from a game that is important. If this enjoyment comes from the gameplay alone, then mission accomplished. If, like Bennett, you also gain pleasure from running a game to its capacity, then that too is fine. In the end, if you're happy, that is all that matters.

Web Serfing

I wanna know what's goin' on with my ranking on ya website? I've been a member for a bit now... Serf, Initiate... and now Learner!?

Have I done something wrong? I'm not pretending to be some hardcore hacker, but I ain't no learner.

Slipee

First of all Slipee – all Atomicans are equal, especially you. The idea of our forum ranks is to encourage good posting. This happens by way of a very powerful force of nature known as 'peer group pressure'. You see, when someone makes a certain number of posts, they get bumped up a rank. There is, therefore, a temptation to 'spam' in order to move more rapidly up the ranks. Try that tactic though and your peers will let it be known that they don't respect your actions. Thus, you will endeavour to post only quality stuff. See the FAQ on our site for more info about Atomic's ongoing social engineering project. We're building a better world for our children – our most important natural resource.

Picture this

About eight or more years ago, a letter written to a magazine I read at the time went along the lines of what I am about to share with you. I did post this in the forums, but it did not create the mass hysteria that I expected. The idea behind it has been fascinating me ever since... so here goes.

Basically, take a computer screen. A grid of (for this example) 1024 dots by 768 dots for a total of 786432 dots. To keep numbers low(ish) assume a colour depth of 16bit (65535 colours).

Now, if you take 786432 and raise it to the power of 65535, in addition to getting a number that calc.exe can't work out, you also get the total number of images that you can view on the described screen. If you devised a program to cycle through every single combination of pixels on the screen, then you would see it all (even this very email as you read it now).

When you think about how many images you can display on a computer screen, it's pretty much anything. So in that large series of pictures is a picture of everyone's face, everyone's house and every location anywhere in the universe plus heaps more. Of course there would also be lots of screens full of useless pixels.

I realise it would take squillions of years, but could this be turned into a distributed computing project like SETI? A quest to see all...

Darrkon

3D schmeedee

It seems hardly anyone cares about 2D graphics performance these days. I know gamers rule, but sometimes 2D performance counts. I continually hear that 2D performance amongst graphics cards doesn't vary much, but I suspect this is crap. Just once I would like to see a line up of graphics cards with 2D benchmarks being quoted. How about it? I will become a lifelong subscriber if you come through.

Dan

This has been an issue that raises its head every now and then, and is a valid one. In fact, when we tested the Gainward SiS315 card in Atomic 13 we used SYSmark2001 to give an indication of just this issue. In those tests, the SiS315 was only slightly behind the GeForce2 MX 400, to the tune of around four per cent. Other tests that we have run in the past have showed a similarly small performance difference. The reason for concentrating upon 3D performance is because that is the area in which research and development is now focused, and where the tangible performance gains are being made.

Atomic server

I've heard in the forums that you guys have a server which you use to test out games, but is it hosted by Wireplay?

We have been having a bit of a talk in the forums and we have come to a conclusion that we think you should open the server to the public, BUT, only to the people that subscribe or are registered in the forums. I don't know how you would do this but it would be so great. Keep up the great work with the mag.

BaNzAi

Wireplay kindly makes a server available to us so we can test multiplay in the games we review. Because, when we review, we review right. We only use it when there are no public servers available, which is really hardly ever.

Anyway, we can't make the Wireplay server available to you because it's not ours and our own in-house server is running near capacity. It's a neat idea though, maybe... one day...

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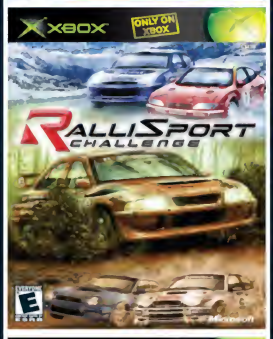

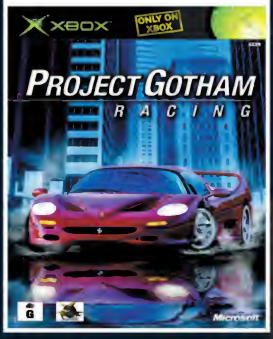

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Blood Wake

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RalliSport Challenge

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Dead or Alive 3

Tecmo's popular arcade fighter has been updated for the Xbox with three new characters, amazing 3D graphics and superior game-play. Dead or Alive 3 has changed the fighting game genre forever. It also happens to be one of the most popular launch titles for the Xbox.

Fuzion Frenzy

A non-stop party game with an edge: go head to head with your friends in six arenas and more than 45 mini-games for a continuous, heart pounding experience. If you thrash your friends, it could become a head pounding experience.

Halo

Human kind is fighting a losing battle against a powerful fellowship of alien races known as the Covenant. Halo features unbelievable graphics, vehicle and foot based combat, and indoor and outdoor fighting in massive continuous worlds. Currently Halo sits at the top of the Xbox sales charts in the US.

Oddworld: Munch's Oddysee

Play as Munch, a Gabbitt with odditude, and Abe, his flatulent sidekick, as they lead a lab rat revolution in this premier action-adventure game. You even get to make him fart by pressing a button on the controller, which will cause anyone watching to laugh like a maniac. True.

Project Gotham Racing

Project Gotham Racing puts you behind the wheel of over 25 of the hottest, sleekest and most desirable cars on the city streets of four of the world's greatest cities. The future generation racing game where pleasure and reward come from focusing equally on speed, flair and risk-taking.

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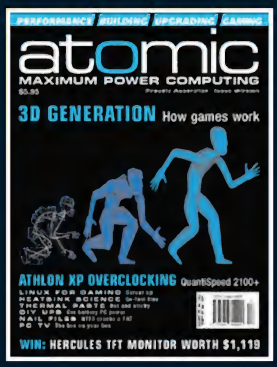
New: Gift subscriptions now available online

Your household probably gets a copy of the NRMA mag 'Open Road'. Every house in Australia seems to. That's nice, because it makes you feel like you're getting a free little pressie and that makes you feel just slightly warmer, overall. But, really, who gives a flying fruck if Don Burke's first car was a metallic brown Cortina? The same people who need to know Australia's Top 500 Barossa Valley romantic getaways, most likely. These days the Foxtel programme is far superior free reading. Not that any of them are really free. There are hidden costs everywhere! Atomic subscriptions are not free, but they're pretty much almost free. Best thing is – they're a bucketload more useful than Don Burke's Cortina or even a weekend of shaggin in the grapes.



Issue 12 subscription winners: The winner of the Radeon 8500 is V Hall, Booragoon WA, and the winner of the Radeon 7500 is D Hagan, Chadstone VIC.These prizes were kindly donated by Australia IT. Call the good people there on 03 9882 1811 and buy something expensive.

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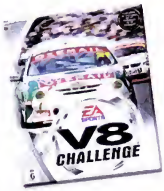

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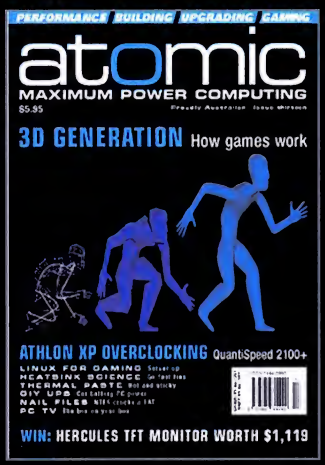

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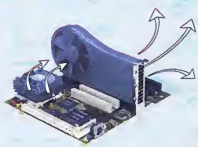

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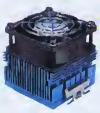

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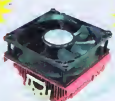

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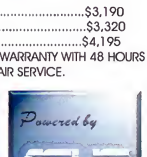

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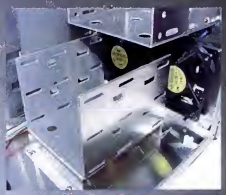

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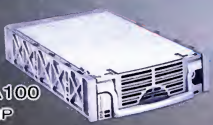

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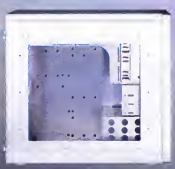

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Game obsession

This is nuts. I was up until 4am this morning playing Civilization III and I'm now nursing a blinding headache and swollen mouse-wrist. My eyes are cranberry-juice red from watching Persians throw their cavalry at my cities, and my throat is raw from laughing raucously when they encounter my armored tank divisions.

Why do we play so hard? It's a question that's plagued many a wife/mother/girlfriend, ever since Apple Panic popped into our homes. What makes me want to miss my precious beauty sleep in favour of a glowing screen? I couldn't answer that for a long time, and my girlfriend knew it. Start up Icewind Dale and she'd go ballistic. 'Why do you play it all the time?' she'd scream lovingly, and all I could say was: 'Because I like it.'

Then one day it hit me – I needed a better excuse.

I took it upon myself to do some research into the psychological behaviour of the game addict. I pulled out my trusty textbooks from the back of the closet, scraped off the years of collected dust and began the search. Nothing under 'game freak' (or my girlfriends suggestion of 'exceptional loser'). But then it jumped out at me, like the proverbial lizard man in Diablo 2.

Yes, game lovers: it seems there is a psychological reason for what we do. It's called personality displacement.

Psychology? Isn't that just an academic's excuse to watch pornography? My years doing university psych gave me little reason to think otherwise, apart from a few interesting dinner party quips. Anyway, the essence of personality displacement is that we have a need to dissociate ourselves from the world around us. We project our own thoughts and actions onto a virtual construct and use it to vent our emotions. In simple terms, we become the tenth-level paladin, blending the helpless cockroach-thing into a red pulp. I sure as hell know that if I see an eight foot cockroach walking down the street I'm not going to run up and start pulling its legs off.

Going back to the books, I found this is where things get a little controversial (read: no one really knows). Sigmund Freud was keen on the idea of transference, not only because is sounds cool, but because it linked with his ideas on childhood. Here's an example of transference: remember the little redhead kid that used to steal your playlunch money? He's now the goblin that's after your inventory. Beat the crap out of him. Feel much better. Simple as that. George Kelly had another idea – he said our core construct (the real person we are) has pressures placed upon it that occasionally need venting. Otherwise we'd just snap. Hence, I play, or I go birko.

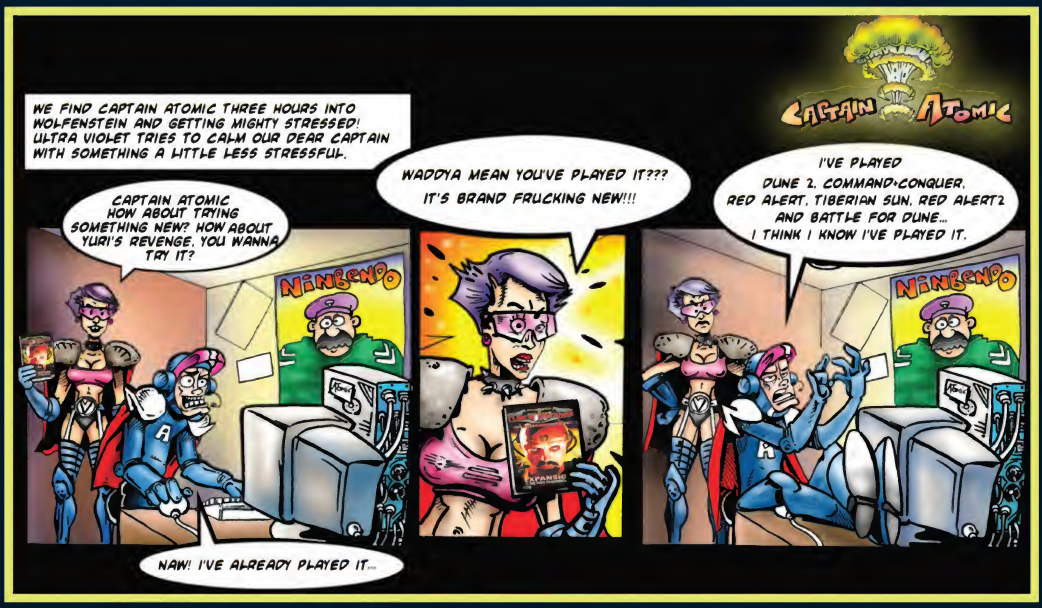
This is a great way to approach an argument with your significant other (memorise it if you can). I've used it twice now and have always managed to get a few more hours on HalfLife. But beware – she can throw the psychology card back at you. Some researchers think the games we play are too removed from reality, and that they should be made more realistic. How about this: along with the fight or defend buttons they should add a run like a girl option? Or in the list of weapons there should be European pillow? Maybe our characters need occasional haircuts, or their ability to see declines and villagers point and laugh.

Obviously, you and I know these additions aren't necessary. It's not really us we want to see on the screen – it's some seven foot Scandinavian warrior with pecs that could crack walnuts, and a codpiece to match.

So bring on the personality displacement, I say – as much as I can cram into a 12 hour sitting. I like the idea of leaving the world of fast food and bank fees for one of high adventure and maximum peril. Sure, I wouldn't want to live in that world fulltime (have you ever seen a toilet in an RPG?) but it's fun while I control the exit button.

All those hours spent hunched over a screen are actually good for you. Next time you're getting ribbed by your partner, whip out this article and point out the facts. Finish with: 'Don't worry dear. I know what's real and what's not.'

John Simpson



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